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ABSTRACT

This paper reviews a number of studies which indicated that the sociocultural context wherein the schools function influences a great many school characteristics. The study was based on the general hypothesis that the structure and functioning of the public schools is influenced by the modernity of the sociocultural context which they serve. Sixty-seven Florida counties and their school systems provided the analytical units of the study. The structural index of modernity was constructed using the attributes of median level of education, proportion of county residents employed in white collar occupations, the percent of families earning over $10,000 per year, and population density. To assess the validity of the general hypothesis, 12 specific hypotheses were developed. These hypotheses focused on relationships between the level of modernity predominating in the social system and selected school district attributes The school district attributes were grouped into: (1) the characteristics of the district's personnel, (2) its financial attributes, and (3) the attributes resulting from the types of orientation instilled in its pupils. Results for nine of the specific hypotheses supported the general hypothesis. The conclusions and implications of the study are discussed and suggestions provided for further research. (Author/MLF)

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THE MODERNITY OF SOCIOCULTURAL CONTEXT: ITS INFLUENCE ON THE FUNCTIONING OF THE PUBLIC SCHOOLS

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THE MODERNITY OF SOCIOCULTURAL CONTEXT: ITS INFLUENCE ON THE FUNCTIONING OF THE PUBLIC SCHOOLS

CHAPTER ONE July 1974

OPEN SYSTEMS, MODERNIZATION AND EDUCATION

This chapter is divided into five sections. The first deals with the nature of the public schools as open social systems, and implications for evaluating school effectiveness from the open and closed systems frameworks are noted. In the second section the essentials of modernization are discussed, and particular emphasis is given to the importance of modernity as a dominant characteristic of the environment in which the schools function. In the third section a model of the modernization process is presented. This model is developed on the basis of the discussion in the preceding sections, and serves as the point of departure for the development of the modernity index in Chapter Two.

In the fourth section of the chapter, the institutional role of the educational system is discussed, and a distinction is made between the perceived nature of this role in more and less modern social systems. In the fifth and final section the major results of the so-called "school effect" studies are examined within the context of the preceding discussion.

The Public Schools as Open Social Systems[1]

A system may be defined as ". . . a set of objects together with relationships between the objects and their attributes" (Hall & Fagan, 1968, p. 81). Open systems are simply those that exchange materials, energies or information with their environment. Open systems are characteristically dependent; that is, the systems are dependent upon their environments for energy used to maintain their structure and functioning. These systems' capability of responding to both real and/or anticipated environmental changes so as to maintain some minimum level of structure and functioning is generally termed an adaptive capability (Herriott & Hodgkins, 1961). The underlying, sequentially organized nature of this adaptive behavior is said to connote purpose (Miller, Galanter, & Pribram, 1960).

From the open systems perspective the above attributes are common to all "living" systems, biological or social. There is, however, a distinction which can be made between these two types of open systems. Social systems differ from biological systems primarily in their contrived nature (Herriott & Hodgkins, 1969). Because social institutions are essentially sub-systems of the larger social system they may be thought of as sub-systems contrived to fulfill rather specific social needs. The responsibility for the fulfillment of these needs is said to constitute the institutional role or the institutional purpose of the

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[1] This discussion is based primarily on that of Herriott and Hodgkins (1969, Ch. 2).

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sub-system. The institutional role of the family is to produce and socialize the young; that of the economic institution concerns the production and distribution of goods and services, that of the educational system is to socialize the young beyond that level attainable by the family, to instill in them those personal qualities and attributes necessary for the maintenance and/or expansion of the larger social order.

There are four functions necessary for the survival of all social systems and sub-systems (Parsons, 1951). These are adaptation, internal maintenance, external or boundary maintenance, and production.[2] The adaptation function focuses on the system's ability to deal with real or anticipated changes in the environment attributes that are relative to the system's survival. Modifying the instructional curriculum to meet "local" demands would be an example of the operation of this function in the school district. The external maintenance function focuses on the system's problem of maintaining organizational inputs e.g. energy, information and materials. At the school district level the operation of this function would be represented by the administration's attempts to maintain a supply of competent teachers, and local financial support. The internal maintenance function relates to distribution of organizational inputs as well as the allocation of power and responsibility within the system. At the district level examples of the operation of this function would be promotions and tenure considerations and the allocation of district monies to instructional and administrative funds. The production function at the institutional level relates to the fulfillment of the purpose or role for which the institutions were contrived. For the public schools, the production function centers on the modification of pupil attributes in a manner consistent with the requirements of the larger social order. From this point of view the pupils are production inputs, as opposed to organizational inputs, and, as such, are considered the "raw material" which is to be modified by the educational process.

As is the case with other forms of open systems the primary characteristic of the relations between the school and its environment is one of dependency. The system of which the school is a sub-system is dependent upon the school's capability to produce students with those skills and attributes which are consistent with the requisites of the larger system. Similarly, the school is dependent upon the environment (or larger system) for both organizational and production inputs. As do other open systems, the school must adapt to environmental variations in order to survive as an institution.

It would appear that certain types of environmental variations should affect the four system functions differently. Schools in rapidly changing environments are likely to emphasize the adaptation function, possibly at the expense of one or more of the remaining functions. For instance, a rapid increase in the student population is known to preclude

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[2] The focus here is on the internal maintenance aspect of the boundary function. Hence the typically used "boundary function" is in all cases omitted and replaced by "internal maintenance."

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complete adherence to state accreditation requirements concerning the matter of teacher certification and placement. At extremes, this might result in a partial loss of state financial support which would in turn require a different type of adaptation as well as increased stress on the external maintenance function. Likewise, schools in affluent, middle class suburbs are known to have more elaborate instructional programs and facilities than those in the less affluent areas (Doll, 1969; Flanagan, 1962; Herriott & Hodgkins, 1969); these same environmental differences are related to differences in organizational, age-grade arrangements (structure) and patterns involving internal maintenance functions, particularly those of teacher morale, status and responsibility (Herriott & Hodgkins, 1969; Herriott & St. John, 1966).

These examples are meant only to suggest something of the nature of the public schools as open social systems. Inferentially, they point to the importance of conceptualizing the environment in which the schools function and to the potential of environmental variations to influence both the structure and functioning of the schools. Consider next the implications of the open systems perspective in the evaluation of school productivity.

In doing so, it is instructive to define a second type of system which is polar to the open system. A closed system is one which, having been established, has no further interaction with its environment and which has characteristics either fixed or temporally determinable based on its initial condition (Buckley, 1968). The essential characteristic of the closed system is then its independence of environmental constraints.

As ideal types the <u>completely</u> closed and <u>completely</u> open systems provide some interesting comparisons concerning the evaluation of the effectiveness of the public schools. If the schools were completely closed social systems, it would be under this condition that they would (could) make their maximum independent contribution to pupil attributes, for they would be completely free of influence due to environmental variations. In contrast, if the public schools were completely open in nature, they could make <u>no independent contribution</u> in the determination of pupil attributes for whatever effect they might have would be consistent with the patterns of environmental influence upon the schools.

On the basis of this rather simple distinction it is apparent that the researcher's perception of the school as a social organization (either basically open or basically closed) predisposes the manner by which and criteria against which he evaluates the productivity of the schools. If the schools are perceived as basically closed, it is a logical extension of this perception to evaluate their effectiveness by comparing their independent contributions to that of the school's environment. This is essentially the procedure used in most school effect studies. The results of these studies are technically correct in their conclusions concerning the moderate independent effectiveness of the public schools in modifying pupil attributes. But, from the perspective of this study, they ignore the fundamentally open nature of the public schools, and in so doing have at least left the door considerably open

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to "over-interpretation" of their results. One of the major purposes of this study is not so much to evaluate the independent effectiveness of the public schools as to investigate selected possibilities concerning how the structure and functioning of the schools are constrained by the characteristics of the environment which they serve.

Modernity and Modernization

In the previous section of this chapter the nature of the public schools as open social systems was discussed. One requisite for understanding any open system is to understand something of the environment in which it exists. In this study environmental characteristics are organized around the constructs of modernity and modernization.

This particular set of constructs was chosen for two reasons. First, the modernization process provides a basis through which substantive meaning may be attributed to the majority of extra-school variables (for instance, economic, educational and rural-urban indices) used in the school effect studies. Second, and more important, the requisites for and results of the modernization process provide for a clear articulation of some of the most essential relationships existing between the school and its environment. As will be subsequently indicated, one of the primary bases for this articulation lies in the relationships between modernization and technological development and between technology and knowledge in general and education in particular.

In formal studies of the modernization process itself, it is the structural characteristics that are usually of greatest interest (Herriott & Hodgkins, 1969). In this study the primary emphasis is on the cultural characteristics. A discussion of the structural characteristics is included for two reasons. First, it is primarily through integration of the structural and cultural characteristics that the sense of the process is most clearly perceived. Second, the structural variables related more or less directly to the modernization process are similar to the extra-school variables used in the school effect studies. These structural variables are often used to index other social stratification indices, particularly social class. As will be subsequently indicated, modernization is the superordinate term interlacing not only social stratification variations but economic and cultural variations as well.

The concept of modernization has generally been applied by economists, sociologists and anthropologists in cross-cultural studies, and has been equated with social change in terms of specialization (resulting from societal differentiation), industrialization, urbanization, and economic development (Herriott & Hodgkins, 1969, p. 33). Modernity is the noun referring to the extent to which the process of modernization has developed. Following are three more or less formal definitions of the term modernization:

> (1) . . . Modernization may be defined as the process by which historically evolved institutions are adapted to the rapidly changing functions that reflect the unprecedented increase in man's knowledge,

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> permitting control over his environment, that accompanied the scientific revolution (Black, 1967, p. 7).
>
> (2) . . . /modernization/ seems to involve: (1) the introduction of a new technology and (2) the social acceptance of the consequences of that technology in both technological and non-technological areas of social life . . . /such development is/ toward an ideal modern state of society wherein the structure and organization of social behavior are maximally adapted to the use of the most advanced technological knowledge for the utlimate material benefits to be derived from its efficient utilization (Herriott & Hodgkins, 1969, p. 33).
>
> (3) . . . What is involved in modernization is a "total" transformation of a traditional or pre-modern society into the types of technology and associated social organizations that characterize the 'advanced,' economically prosperous, and relatively politically stable nations of the western world (Moore, 1963, p. 89).

On the basis of these definitions, it would appear that there are at least two factors involved in modernization, the introduction of advanced technology and the adaptation of social institutions to the maximum utilization of this technology.

Technology is herein defined as "the science of practically, systematically and efficiently applying knowledge in the control, production, and utilization of energy in the production of goods and services." Technological development is the common element in each of the previously identified characteristics associated with modernization, e.g. industrialization, urbanization and economic development. Industrialization, of course, cannot occur in the absence of a reasonably well developed technology. Additionally it is known (Haire, 1964) that industrial characteristics are determined to a large extent by the kind of technology available at any particular point in time.

One of the most salient characteristics of urbanization is population density (Durkheim, 1964). Yet, there have existed, and still exist, areas of very high population density which do not exhibit the characteristics of modern cities. It is only with the advent of a highly developed technology that these high density areas reflect the conglomerate characteristics associated with urbanization (Hauser, 1965).

Across as well as within societies there are strong associations between both the availability of technology and the propensity to utilize technology and the extent of the social systems economic development (Herriott & Hodgkins, 1969; Smelser, 1964. . . . Because of the American tendency toward a materialistic interpretation of cause and effect relationships, cultural and social characteristics accompanying technological development and implementation sometimes have erroneously been attributed solely to economic conditions. Technological development may be construed as a means to an economic end, but this does not unrestrictedly

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imply the validity of economic theories of modernization (Hagan, 1962; Myrdal, 1968). In the interpretation of the cause of social characteristics resulting from the modernization process, one must distinguish between the motive underpinning the process and the mechanism through which the process occurs (Ellul, 1967). The mechanism through which the modernization process occurs is technological development and implementation. It is the mechanism of technological development and not the underlying economic motive which prescribes the variations in social characteristics across differing levels of system modernity.

These societal characteristics--economic development, urbanization and industrialization--delineate three of the most apparent differences in societies representing varying levels of modernity, and they are among the characteristics most emphasized by economists, historians and economic geographers who deal mostly with societal comparisons. These are also the variables which either directly or indirectly relate quite easily to the environmental variables included in the school effect studies, e.g. the economic affluence of the neighborhood, whether or not the school is in a highly urbanized area, and whether or not it is in an industrial or primarily agricultural area.

Structural and Cultural Concomitants of Modernization

The level of technological development is closely related to the extent of societal differentiation and functional specialization. Social systems, like biological systems, are processors of energy, and it is the level of technological development that by and large determines the quantity and form (animate or inanimate) of energy available to the social system. It is characteristic of all social systems that as the per capita production and utilization of energy increases the system evidences increasing structural differentiation and functional specialization (Levy, 1966). This is true whether the analytic unit is social institution (Black, 1967) or roles and occupations (Blau & Duncan, 1967). The number of differing functional roles in the traditional society is small in comparison to those in the modern society which, Levy maintains, in the United States exceeds 100,000 (1966, pp. 170-180). This varying degree of differentiation of structure and specialization of function occurs within, as well as between societies (Smelser, 1964), and is related to other major sociological dimensions.

Stratification is one such dimension so affected. The lower social classes manifest considerably less differentiation and specialization than the middle classes. This is true, at least in part, because the history of the development and implementation of technology can be written in the rise and expansion of the middle class. The majority of new occupations produced by increased technology may be defined, a priori, as middle class; additionally, the individual's occupation is the single most important criterion in the determination of social class (Blau & Duncan, 1967). It may well be, as Herriott and Hodgkins have suggested (1969, p. 118-119), that as social systems reach increasingly advanced levels of modernity, the dimensions of social stratification become increasingly aligned with the individual's position in the technological order, with the amount of special training necessary to fulfill the requirements of the position, and with the importance of the position in the maintenance and expansion of this order.

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A second major sociological dimension reflecting differences in differentiation and specialization is the rural-urban continuum (Hauser, 1965). Historically, the first areas to modernize within a society are the high population density areas, and they are today the most modern. This is a common phenomenon, as characteristic of the underdeveloped South Asian nations as of the front runners in the modernization process (Myrdal, 1968).

The structural changes noted above are accompanied by concomitant variations in the cultural characteristics of the social system. The culture of a social system may be defined as "the pattern of all those arrangements, material or behavioral, which have been adopted by a society as the traditional ways of solving the problems of its members" (Krech, Crutchfield, & Ballachy, 1962, p. 380). As generally used, culture is a superordinate term including among other things, values, beliefs, norms and premises more or less common to the system members.

The standards which govern the organization of values in the traditional society are described as particularistic, that is, they depend on the social rank of the individual to be evaluated, while those in the modern society are more universalistic, the same set of standards applying to all individuals (Parsons and Shils, 1952). Additionally, in the traditional society social acts are generally multipurpose, supporting or antagonizing simultaneously religious, political, economic, and educational standards. In the modern society social acts are frequently described as functionally specific, the standards against which the acts are evaluated being specific to the particular function served (Redfield, 1957). The traditional intracultural homogeneity and the multidimensionality of the standards against which any <u>single</u> social act is evaluated are thought to be two of the major reasons why change is slow and difficult in the traditional society (Hagan, 1962; Hoselitz, 1963).

These differences in pattern are accompanied by content differences, as might be expected. It is, for instance, difficult to imagine a culture organized around ascription, particularism, and mechanical solidarity that produces many creative, innovative or entrepreneural individuals, all of whom the process of modernization requires.

The traditional or pre-modern cultures have been characterized as highly authoritarian and conservative, oriented to the "fixedness of things" and the immutability of both the status quo and fate (Hagan, 1962; Myrdal, 1968). Other writers have characterized the traditional cultures as past oriented, emphasizing feelings of complete subordination to nature, picturing the basic nature of man as evil, and believing that the path to greatness is found in returning to "a past set of norms whose revival would again lead to splendor and greatness," (Hoselitz, 1962; Kluckhohn & Strodbeck, 1961; Weber, 1946).

McClosky (1958) documents several elements common to the traditional ideology. These are that: man is basically an emotional rather than a rational animal; religion is the foundation of a civil society which is bewildering in its complexity; it is the religious belief, the reliance on order, authority and duty, and the working for the common

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community good that are man's bulwarks against violence and anarchy; social change is generally to be avoided for it is the product of "sophisters and calculators"; social classes derive from the basic inequality of man and, like all institutions having withstood the test of time, should be maintained (pp. 30-31).

These characteristics contrast with the values and characteristics of modern man (Myrdal, 1968; Inkeles, 1966): (1) an openness to innovation and change, (2) an orientation to problems and issues not limited to those in his immediate environment (the local-cosmopolitan distinction), (3) a tendency to be more mentally flexible and less closed-minded (in the Rokeach sense), (4) a greater emphasis on the future and less on the past as evidenced by sequentially organized patterns of action, (5) a belief in man's ability to dominate and control his environment, and faith in science and technology, (6) a belief in the utility of rational (as opposed to emotional) action, (7) a positive evaluation of efficiency, and social and economic equalization, and (8) positive attitudes concerning honesty, frugality, and the desirability of forestalling gratification for later benefit.

Smith and Inkeles (1966) have demonstrated, in a cross-cultural study of six nations, the correspondence between personal attributes and values such as these and the modernity of the nation. These personal attributes and values are flavored by a strong dosage of Western pragmatism. As Williams (1963) has noted, in referring to the United States, it is not difficult to understand why a national melting pot, without a grand and glorious heritage and without a highly developed homogeneous culture, is the front-runner in the modernization process.

Those characteristics listed above are particularly pertinent to the facilitation of modernization at the level now manifest in the United States, Western Europe and selected Asian nations. The process of modernization is slow and uneven. Those same characteristics which facilitate development at the initial stages may impede it in later stages (Smelser, 1964). The above characteristics, then, more appropriately designate the direction in which culture must change to facilitate technological progress rather than the level of sophistication necessary for change to occur. This means that the requirements necessary for increased modernity must be relative to the level of sociocultural sophistication existing at any point in time. It is one thing, for instance, to describe the cultural requisites necessary for Indonesia to increase its level of technological development and assimilation. It is quite another to list these requisites for the United States.

The importance of these cultural variations and similarities lies in the fact that these cultural variations covary with the same structural, economic and educational measures both within and between societies, and that these measures in turn covary with the extent of technological development and utilization. The patterning of relationships between these three components is obviously quite complex, and no simple necessary and sufficient set of conditions can be established. The relationships between these components (culture, structure, and technology) historically and developmentally operate as a mutually causal system

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(Maruyma, 1968). That is, each depends upon and reinforces change in the other. But once the modernization process achieves a rather sophisticated level of development the relationships are no longer mutually causal. Certain of the relationships become much more important than others.

This variation in importance is especially true within a social system as modern as the United States. In the continental United States there can be no question of the availability of technology, and hence the absence of technology cannot be considered a causal factor in sub-system variations in modernity. Rather, the major causal relationships exist between the implementation of technology and the cultural parameters. As in all cases, a major change in the structural phenomena (including educational and economic indices) is dependent upon not only the availability of technology, but also upon its implementation (Levy, 1966). And, based on anthropological research (Hanks, 1958; Spicer, 1965), it appears that the primary link between the availability of technology and its implementation is the extent to which the requirements for and results of this implementation are consistent with the culture (values, norms, beliefs, etc.) of the system in question.

This discussion of the attributes of the modern culture by and large concludes the review of the literature on the modernization process as it reflected in the sociological, anthropological, and economics literature. Due to the breadth of this literature the choice of topics has been, of necessity, restricted. In this section the intent has been to discuss those aspects of modernization which are essential to the "sense" of the process, and which are relevant to the purposes of this study. Such topics as nationalism and the development of elaborate transportation and communications systems, although related to the concept of modernity, have not been included because they do not greatly contribute to the understanding of the process as it is relevant to the purposes of this study.

A Model of the Modernization Process

Having revieved the essentials of modernization, it is helpful to represent the process schematically. A schema of modernization process as interpreted in this study is presented in Figure 1. The schema is intended as a heuristic device through which the process may be represented symbolically (Travers, 1965). It is in no way intended that the model represents either all the components of or all the restrictions on the process.

The model indicates that the first essential ingredient for the modernization process is new knowledge. Initially this knowledge may be produced within the social system by innovation or it may come from external sources via diffusion (Herriott & Hodgkins, 1969). For facilitation of the modernization process the knowledge must be assimilated into the socio-cultural context. Interposing between the production of knowledge and its assimilation is a cultural filter. This filter is viewed as being semi-permeable in much the same sense as a living cell membrane. The permeability of the filter is always relative to knowledge content

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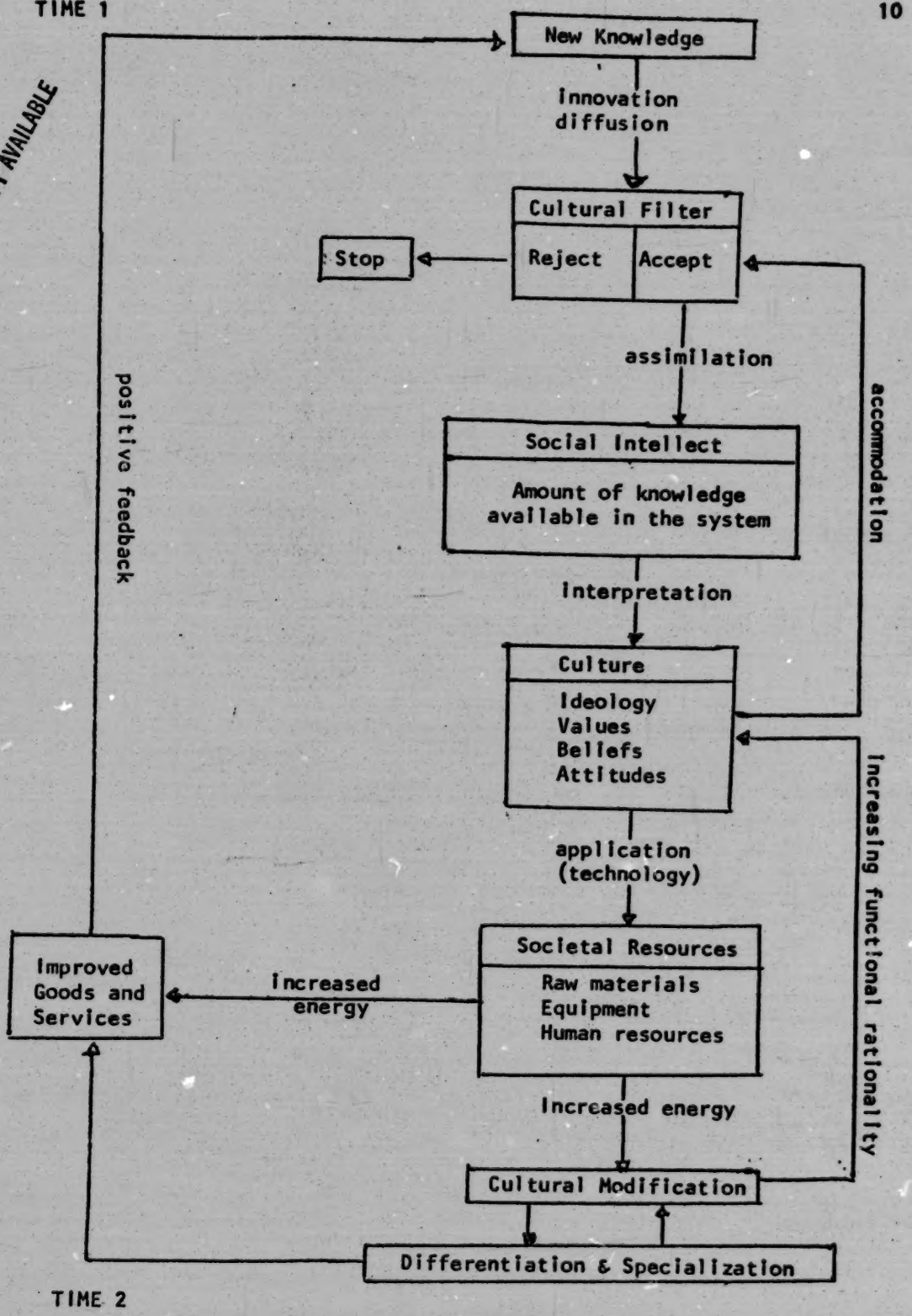

Fig. 1. A Model of the Modernization Process

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and is determined by the cultural characteristics at any point in time. If the knowledge is not too deviant from existing values, beliefs, ideologies and attitudes, it may permeate the system; if it is not consonant it will not be accepted and the process will terminate; that is, the social system will become or remain static as far as change relative to this knowledge is concerned.

What has been called the social intellect represents the amount of knowledge available to the system at time one. As new knowledge permeates the system the amount of knowledge increases. Having been assimilated into the social intellect, the knowledge is interpreted relative to the cultural attitudes, values, beliefs and ideologies, and applied to the societal resources. The reader has possibly noted that knowledge rather than technology is the primary input for the modernization process. The model indicates that knowledge is technological only if it is applied to societal resources. Technology as it is used here has the broadest possible connotation and is not limited to "machine related" knowledge. The knowledge of the classroom teacher is technological insofar as it is systematically, practically, and efficiently applied to a particular resource termed the pupil, with the intent of producing in that pupil an increased state of knowledge. In short, there is sociological, psychological, and educational technology just as there is engineering, medical, and agricultural technology. This interpretation of technology, though not conventional, is consistent with the formal definition of technology given earlier.

Continuing through the model, increased energy is the result of applying technology to societal resources. Conceptually this energy may be physical as in the case of electricity or it may be symbolic as in the case of monies. Part of this increased energy is absorbed by the process of increasing structural differentiation and functional specialization, as in the case of training more teachers, engineers, and doctors. Part is absorbed in the process of cultural modification as in the case of integrating immigrants in the social system, or by a frontal attack by the government, cultural elite, or special interest groups on existing beliefs, attitudes, values and ideologies.

The final portion of the increase in energy is absorbed in the improvement and increase in goods and services. Earlier in this paper it was stated that it is possible to interpret the force behind technological development and implementation as an economic motive. The present model indicates that increased goods and services are partial results of the modernization process, perhaps initially the only intended ones; but the model also indicates that cultural change and increased differentiation and specialization are equally predictable and necessary results of the process even though they might not have been intended. The primary dependency of increased goods and services on increased differentiation and specialization is represented by the single arrow, indicating that though goods and services may be increased within the system by virtue of increased energy, a sustained increase ultimately is dependent upon increased differentiation and specialization.

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As the modernization process advances, the characteristics of the goods and services produced changes both quantitatively and qualitatively. Of particular importance in the model is the increasing emphasis placed on knowledge and its related services of training and educating. In short, as societies become more modern increasing emphasis is placed on knowledge, training, and educating both as inputs and outputs of the production process. In the initial stages of modernization, knowledge is produced incidentally. But as the system becomes more complex and as the technology becomes more sophisticated, the process cannot proceed without a formal integration of knowledge, training, and education into the goals of the production process. It is for this reason that all modern societies develop institutionalized educational systems (Herriott & Hodgkins, 1969; Smelser, 1964).

In completing the loop specified by the model, the knowledge produced as a component of the increased goods and services feeds back into the sequence, is subjected to the cultural filter and so on. The model implies a positively accelerating process indicating that the more modern social systems will modernize at a faster rate than the less modern systems (Smelser, 1964, Levy, 1966). In the absence of external intervention or internal modification as by change in governmental policies or social revolt, this indication follows reasonably well the course of history.

In the following chapter, portions of the model will be operationalized in the development of a modernity index. At this juncture the model is important because it emphasizes the following relationships: (1) even though the process occurs sequentially over time, the model indicates considerable concomitant variation between the characteristics of the various components; (2) it indicates that two of the most fundamental attributes determining the rate of the process are the cultural characteristics and the availability of knowledge; (3) it indicates that as the social system modernizes the cultural characteristics develop in the direction of increasing functional rationality; and (4) it indicates that the more modern the social system, the more knowledge, education, and training become goals in the production process, and hence the more valuable they become. This value is both economic and psychosociological. Each of these four relationships will be useful in the remaining portions of this chapter. It is the latter two that afford the primary bridge between modernity and education.

Modernity and the Institutional Role of Education

Modernization and education have been closely associated in the course of history (Spengler, 1966). The modern nations, relative to their less modern counterparts, more frequently evidence formalized bureaucratic educational systems and higher levels of per capita educational attainment. Because the educational level of the population becomes a major societal resource (Drucker, 1965; Galbraith, 1965), the most modern nations expand their number of elementary and secondary schools, colleges and universities, school attendance laws, proportion of the national budget allocated to education, and the like. Additionally, there is considerable evidence that the association between modernity and such

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attributes as these are found within, as well as between, societies (Herriott & Hodgkins, 1969; Inkeles, 1966; Myrdal, 1968).

The most salient differences between education in the traditional and modern societies are, however, as much qualitative as quantitative. In the pre-modern society the basic function of education is one of symbolizing social stature. Due to the highly ascriptive nature of this type of society, the level of educational attainment is more a sign of than a cause of the individual's social position (Halsey, Floud, & Anderson, 1965). Its function is basically conservative, in maintaining the status quo. Due partially to this conservative function the content of education focuses primarily on the "gentlemanly arts" (Myrdal, 1968).

In contrast, one of the basic functions of education in the modern society may be interpreted as social selection. Due primarily to the social and technological complexity of the modern society and its functional rationality, those individuals who can best perform certain specific functions are selected out of the larger group. Because the educational system in the modern society is closely aligned with the production process, its content focuses on the sciences, mathematics, and the applied fields. This content is functional for the expansion and maintenance of the modernization process. It is partly for this reason that in the modern society education is a major means of social mobility, and that its contribution to the dimensions of social stratification are second only to occupation (Bergel, 1962; Reiss, 1961).

A second way in which education in the modern society differs from in the pre-modern society is in the localism of the latter's standards and goals. [illegible]. The school system in the less modern nations or areas adopts standards based on the local socio-cultural milieu. If one assumes that the rural areas are less modern than the urban areas, this implication is consistent with the finding from a national survey of American public school teachers and administrators (National Education Association, 1967) that teachers and principals from the rural areas were more likely to use schools in close geographic proximity for comparison purposes while the urban respondents indicated their comparisons were more often made on the basis of national norms. This localism of the less modern school in the United States is a vestigial remnant of traditional social solidarity. Much more than the modern school, the pre-modern school has as one of its primary purposes the maintenance of the local culture (Corwin, 1965).

Finally, modern and pre-modern educational systems differ in the type of orientation instilled in their students. Lerner (1958) maintains that one of the most fundamental requisites for modernization is " . . . the infusion of a rationalist and positivist spirt" into the general public (p. 45). In the modern society the purpose of the educational system is not only to transmit or produce in the student the basic fund of knowledge necessary for the maintenance and expansion of the technological order, but also to inculcate in the student the tendency to act upon and use this knowledge, the rationalist and positivist spirit.

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These differences in the educational systems of modern and traditional societies are pervasive. The differences are indicative of phenomena that characterize nearly every aspect of the process of education. They are indicative not only of different patterns of who goes to school and how long they remain in school, but also of differences in the subject matter content, in the bases on which administrative decisions are made, in the types of teachers employed or remaining employed, and perhaps more importantly, in the type of environmental perspective inculcated in the students.

Within the context of this discussion it is important to consider the institutional role of the public schools. At the societal or national level the purpose of the American public schools is to instill or produce in its students the specialized knowledge and the rationalist and positivist orientation so necessary for participation in a technologically and socially complex environment. The modern school is contrived to facilitate the emphasis on success, achievement and progress.[3]

But the public school exists not only in this national-institutional environment, it exists at a more fundamental level in a local environment, and of these two environments, it is the local level that has the major legal and financial responsibility for the conduct of the educational process.[4] If the public school exists in a modern local environment, its basic institutional role must be consistent with the requirements of that environment. In contrast, if the school exists in a more traditional and conservative milieu, its "local" and national-institutional purposes are less likely coincidental.

Modernity and the School Effect and Related Studies

In a school effect study the researcher attempts to evaluate the relative importance of school characteristics and pupil-community socioeconomic attributes in the determination of production output (pupil) characteristics of the school or school system. The most frequently used school characteristics are personnel attributes (experience and level of training), financial attributes (mean salaries and expenditures per pupil), curricular and facility characteristics, and size. The most commonly used social stratification indices are median level of education, per cent of the community in white collar occupations, per capita wealth and/or average cost of housing.

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[3] This is not to imply that all modern schools are successfully so contrived. Note, for instance, the interaction between social class and urbanization discussed later (pg. 16). Local circumstance, e.g. consonance between school requirements and pupils' life styles and perceptions or type of school leadership, might alter the success of this contrivance.

[4] Presumed in this statement is the notion of the cultural-structural homogeneity of the geopolitical unit surrounding the school or school system. Such presumptions obviously are limited to being general and not specifically valid. In this regard it is interesting to note that only with the Hodgkins & Herriott (1969) report has the concept of modernization been used to explain structural and/or cultural variations within national boundaries, previous writers apparently assuming a high degree of national homogeneity.

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A number of school effect studies have been conducted in the last ten to fifteen years (Burkhead, 1967; Cline, 1966; Coleman, et al., 1966; Flanagan, Dailey, Shaycroft, Orr, & Goldberg, 1962; Goodman, 1959; Mollenkopf & Melville, 1956; Shaycroft, 1967; Wilson, 1966). A comprehensive review of these studies individually is beyond the scope of this paper. Because their findings relevant to the purpose of this study are, in general, consistent, the studies will be summarized briefly and generally.

The overriding finding of these studies is that social stratification indices such as economic development and educational level are by far the most potent predictors of achievement and college attendance rates. The studies indicate that the reliabilities of the dependent measures, where available, are nearly perfect. Generally, forty to sixty percent of the variance in the pupil attribute variables is related to either school or social stratification indices. Of this accountable variance, roughly two-thirds to three-fourths is attributable to variations in pupil-community, social-stratification indices. In no case do the school characteristics contribute greatly to these pupil characteristics independently of the social stratification indices. The greatest of the school contributions appear to operate through the characteristics of teachers, their I.Q., their level of education and experience. This finding of the overriding influence of social stratification indices is quite consistent with the modernity framework. Because the social stratification indices are related to the increasing value of knowledge and the increasing functional rationality of values, beliefs, attitudes and ideologies, it is quite reasonable to expect that they are also associated with higher achievement and increased college attendance rates.

A second major finding of these studies is also consistent with the modernization framework. Where the contributions of the social stratification indices to achievement and college attendance rates were analyzed separately for rural and urban areas, it was found that the contributions are consistently and substantially higher in the high population density areas than the low density areas. There are at least two possible explanations for this finding. First, it is known (Gulliksen, 1950) that restriction in the range (variance) of either or both of two correlated variables will generally reduce the magnitude of the correlation. It is reasonable to expect that in the rural areas the variance of the social stratification indices and the achievement and college attendance rates is not as great as in the urban areas. Therefore it is reasonable to expect the correlations to be greater in the urban than rural areas. The expected reduction in the correlation depends, of course, both on the degree of restriction and the manner in which the restriction occurs (Brewer & Hills, 1969). Data in these studies are not reported in a manner which allows for estimating the reduction in the correlation coefficient.

The second explanation involves differences in the modernity of the areas surrounding the schools. It will be remembered that the less modern areas evidence greater cultural homogeneity than the more modern areas. To the extent that rural areas are less modern, the variance in the cultural characteristics is not as closely associated with variance in the

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measures of socio-economic stratification as in the urban areas. Therefore, to the extent that the social stratification indices are operative in the prediction of achievement and college attendance because of their association with cultural differences, the stratification indices would not be as predictive in the rural as in the urban areas.

On the basis of the data provided in these studies it is not possible to choose conclusively between these two explanations, but at least partial support for the modernity explanation is provided by Boyle (1966), Michael (1961), Wilson (1959, 1966), and Levine, Mitchell, and Havighurst (1971). The general finding of these authors is that lower class students who attend predominantly middle-class schools have achievement levels and/or college attendance rates that are considerably higher than those of their counterparts who attend lower-class schools. Similarly, the middle-class student who attends a predominantly lower-class school evidences less academic skill and preference for college than his counterparts attending predominantly middle-class schools. These studies suggest the potency of the cultural context quite in line with expectations derived from consideration of the effects of modernity as mediated through cultural differences.

The school effect studies evidence a slight, second degree, inverted U-shaped function between school size and achievement. This result is possibly best explained in the light of the findings from the Herriott and Hodgkins study (1969). It is generally accepted that the urban areas have the higher levels of median education, per capita wealth and proportion of the population engaged in white collar occupations. Thus, measures of social stratification are moderately correlated with population density. It is also known that the central city, as opposed to suburban areas, have the largest schools, and that these schools are the most homogeneous in terms of social class, largely by virtue of de facto segregation. Using analysis of variance techniques Herriott and Hodgkins found a very strong interaction between the social-class composition of the school and its central city, non-central-city location. The interaction was such that lower class students in central city schools were more likely to drop out of school, scored lower on the achievement tests and had a higher percentage of age-grade retardation than their suburban or even more rural counterparts. What has been interpreted in the school effect studies as a second degree function between school size and achievement is, quite possibly, due to the interaction (undetected in these studies) between social class and the central city, non-central-city location of the school.

The interaction may be interpreted in terms of the cultural context of the area surrounding the school. From the modernization perspective the underlying characteristic in both the rural and central city schools is increased cultural homogeneity.[5] In the rural areas the cultural homogeneity occurs across variance in social stratification indices.

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[5]The term cultural homogeneity is relative, and implies only that the individuals' social perspectives are more similar under some than under other circumstances.

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In the very high density central city schools, largely as a result of de facto school and residential segregation, cultural homogeneity occurs within the varying levels of social stratification. Contrary to the experience of his rural or suburban counterpart, the lower-class student in the central city schools does not often have contact with individuals of differing ethnic and social class backgrounds. Under these conditions of isolation which is due as much or more to social class as to race, it is reasonable to expect that subcultures develop, and that these subcultures are, in the main, quite different from those composed of modern values, beliefs, attitudes, and ideologies.

Two of the school effect studies (Coleman, et al., 1966; and Wilson, 1966) included several questions concerning the student's perception of his own life chances and the degree to which he felt he had control over his destiny. Belief in a positive capability of controlling one's destiny (environment) is among the most basic attributes of modern man. Though, in both studies this belief was related to the students' socio-economic background and to the social context of the school, it made moderate and independent contributions to achievement.

The school effect and Herriott and Hodgkins (1969) studies also indicate that schools in the more modern socio-cultural contexts have more highly trained and experienced teachers, higher teacher salaries, more college preparatory courses, better library facilities and better technical and secretarial training facilities. The work of Herriott and St. John (1966) indicates that teachers in the lower class schools, relative to those in middle-class schools, are more oriented toward maintaining discipline, more desirous of moving to a "better" school, and more inclined to perceive their pupils (and their parents) as less interested in academic success.

In summary, these studies indicate that the sociocultural context in which the schools function influences a great many school characteristics. The schools do not function independent of their environment. Given this conclusion, it is reasonable to postulate that one of the reasons the schools do not appear to contribute more markedly and independently in modifying the performance and behavior of their students is because their functioning is so strongly influenced by the local environment. The most profitable method of determining the major source of these environmental constraints is problematic. As has been previously stated, one possible set of constructs which may be used to understand these constraints is modernization and modernity. The general hypothesis of the present study is an attempt to provide at least partial support for the preceding interpretations. It states that the structure and functioning of the public schools is influenced by the modernity of the sociocultural context which they serve. In the following chapters, this general hypothesis will be operationalized in terms of both the structure and functioning of the Florida public school systems.

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CHAPTER TWO

DEVELOPMENT AND CONTENT OF THE MODERNITY INDEX

Conceptually, the model may be divided into two basic types of components, structural and content components. Whereas the structural component is indicative of the quantity of energy available and the capability to use the energy, the content component reflects the parameters establishing the priorities which determine the manner in which the energy is utilized. These two components are not viewed as being functionally independent. Rather, as was indicated in the discussion of the modernization process, they are inextricably related by virtue of the belief-value-ideology requirements for technological development and the dependency of the availability and capability to utilize energy upon the extent of technological development. The extent of their actual association will be considered in a later portion of this chapter.

The Structural Components of the Modernization Index

One of the structural primary constraints on the modernization process and hence on the level of modernity achieved by the geo-political unit, is the per capita level of information or knowledge. In the discussion of the modernization model, this knowledge level was designated the "social intellect." In the structural index this designate will be represented by the median level of education of county residents.[6]

A second fundamental structural attribute of an open system is its tendency to develop into more complex forms, to undergo structural differentiation and functional specialization. In social systems this complexity, or differentiation-specialization attribute, is reflected in the number and diversity of specialized roles on a per capita basis, such as the number of doctors or engineers per resident. Such specialized roles are mainly of a white collar nature. Because information on specific specialties was not available, the proportion of the county population employed in white collar occupations was chosen to represent the extent of differentiation and specialization inherent in the county structure.

A third structural measure of the modernization process and the amount of energy processed by the social system is the level of economic development measured by such variables as the amount and diversity of goods and services produced. In the absence of any direct measure of quantity of goods and services produced and consumed at the county level (e.g. a measure of gross national product), the level of economic development will be represented in financial terms by the percent of families earning over $10,000 per year. (The decision to use this particular variable was arbitrary, but the percent of families

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[6] As explained in the next chapter, the units of analysis to be used in the present study are counties in the State of Florida.

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earning less than $3,000 per year and the included variable are almost perfectly redundant: (r = .90).

A fourth variable--population density--was included in the structural index primarily as a proxy variable representing the extent to which the system is urbanized. This proxy measure is included because urbanization is one of the most frequently used indices in cross-cultural studies (Herriott and Hodgkins, 1969).

These four attributes, median level of education, proportion of county residents employed in white collar occupations, the percent of families earning over $10,000 per year, and population density, were used to construct the structural index of modernity. The procedure used to construct the index was to produce county factor scores based on the loadings of the four variables on the first unrotated principle axis (Harmon, 1960; King, 1963). This procedure is one method for abstracting a best linear composite based upon the common variance between the variables. The weighted composite results in a new variable with a mean of approximately 50 and a standard deviation of approximately 10. The factor loadings are presented in Table 1.[7]

TABLE 1

FACTOR LOADING FOR STRUCTURAL INDEX

Variable Name	Loading
Median level of education	.90
Percent over $10,000	.87
Proportion white collar	.92
Population density	.64

The loadings in Table 1 indicate that the first three variables, education, income, and proportion white collar, are more determinative of the structural index than the latter variable, population density. This is to be expected since population density was a proxy variable representing urbanization.

Both the similarity of sign and the magnitude of the factor loadings in the structural index are supportive of the earlier contention that there is substantial similarity in the patterns of covariation between the model elements across varying levels of modernity.

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[7]The coefficients for producing the index are 2.397, 0.411, 0.893, 0.010, respectively. The intercept constant is 45.227.

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The Content Component of the Modernization Index

As was stated previously, the content component of the modernization model reflects the parameters, (belief-value-ideology complexes) establishing the priorities determining the manner in which the system's energy is utilized or expended. In the present study it is assumed that value-belief-ideology patterns of traditionalistic and modern types can be represented on a continuum, and are polar with respect to one another. Given this assumption, the major consideration in development of the cultural index was to find some variable that might reasonably well represent variations in the belief-value-ideology complexes across the Florida counties. A number of alternative sources of information were considered. Among these were religious and political group memberships. Of these alternatives, the only one consistently available in all counties was the percent of the total 1968 Presidential election votes cast for George C. Wallace.

On the assumption that individuals in the state of Florida voting for Wallace have traditional belief-value-ideology complexes, the proportion of the total county votes cast for Wallace in the 1968 presidential election was selected as an index (or proxy variable) of the county's traditionalistic ideology, the content component of the model. Inferentially, the Wallace vote may be taken to represent both the extent to which the predominant county (or social system) belief-value-ideology complex is not supportive of the modernization process, and the extent to which the parameters governing the decision-making processes are not consistent with, or are different from, those parameters affecting the decisions made in the more modern counties. On this basis it was expected that the content component of the model would be negatively associated with the structural component. The correlations between the variables composing the structural index, the structural index itself and the content component, or Wallace vote, appear in Table 2.

TABLE 2

CORRELATIONS BETWEEN THE STRUCTURAL VARIABLES AND THE CONTENT COMPONENT OF THE MODERNITY INDEX

Variable Name	Correlation
Median education	-.68
Percent over $10,000	-.57
Proportion white collar	-.58
Population density	-.43
Structural index	-.72

The zero-order correlations in Table 2 are supportive of the expectations discussed above. Each of the correlations is negative, thus lending support to the use of the Wallace vote as an index of traditionalistic

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rationality. The fact that the median level of education, excepting the structural index, has the highest correlation is consistent with the modernization model which represents the primary input of the process as information or knowledge.

This high correlation is also consistent with the work of Inkeles (1969) who found in a cross-cultural analysis of the predictors of modern values, beliefs and attitudes that the best single predictor of these individual attributes is the extent of the individual's tenure in a formal educational institution. There is, however, a major limitation in using the Wallace vote as a measure of traditionalistic ideology. A consideration of this major limitation leads to the development of the final modernity index, the next topic of discussion.

The Development of the Final Modernity Index

At this juncture two indices of modernity had been developed. While there is substantial similarity between the two indices ($r = -.72$), there is also substantial disparity. Only approximately 50 percent of their variance is common. This disparity is to be expected, partly because the two indices represent different types of phenomena. The structural index is only a modernization variant of a general social stratification index. The content index represents the cultural characteristics, more particularly, the type of belief-value-ideology complexes that predominate in the social system.

One problem requiring the further development of the Modernity Index has to do with probable confounding influences affecting the nature of the Wallace vote itself. The use of the Wallace vote as an index of traditionalistic reasoning, it will be remembered, is predicated on the assumption of ideological identification; that is, people who vote for Wallace do so because they hold value-belief-ideology complexes similar to those evidenced by Wallace himself. While the negative correlation between the structural index and the Wallace vote is supportive of this assumption, it is reasonable to assume that other influences in addition to the ideological identification mediate the presidential voting patterns.

Two considerations that are likely to influence the pattern of the Wallace vote are the strength of the local Republican and Democratic political machines, and the somewhat typical behavior of the American voter who often votes as much on a party line basis as on a consideration of candidates and issues (Campbell, 1960). In addition to these considerations, there is the possible pragmatism of voting for a candidate who, though less "desirable," has a better chance of success.

In any case, these and other considerations are likely to moderate voting behavior over and above the effects due to preferences based on ideological similarity. Thus, it appears likely that there is considerable error in using the Wallace vote as the only variable representing traditionalistic ideology. Because of this potential error, the decision was made (prior to knowledge about their correlations) to correct the content index so that it would reflect more closely the results of the structural index. The correction is based on the assumption of

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covariation between the structural and content components of the modernization process.

In correcting the content index, it was decided that the most appropriate procedure would yield a final index that was equally determined by the structural and content components. This end was achieved by producing factor scores for the counties based on the principle axis derived from the correlation between the two components.

The final modernity index scores are factor scores based on this procedure. They were computed by a modification of the method described in Harmon (1960). In this case the procedure is essentially equivalent to bisecting with a line (factor) the angle between the two regression lines which result from predicting each modernity index from the other, and thus producing the scores by projecting the data points on to this line. As was the case with the structural index, the resulting county scores are standardized so as to have a mean of approximately 50 and a standard deviation of approximately 10. The sign of this final index was determined so that higher scores represent increasing modernity. The zero-order correlations of all component variables, including the structural and content indexes, with the final modernity index are presented in Table 3.[8]

TABLE 3

CORRELATIONS OF THE COMPONENT VARIABLES WITH THE FINAL MODERNITY INDEX

Variable	Correlation
Median education	.85
Percent over $10,000	.79
Percent white collar	.82
Population density	.58
Structural index	.93
Content index	-.93

In Table 3 it will be noted that a substantial portion of the variance in the component variables is retained in the final modernity index. Eighty-seven percent of the variance in the structural and content indices is retained in the final index. Only one variable, population density, has less than one-half of its original variance retained. The remaining variables share with the final index approximately two-thirds or more of their original variance.

[8]The coefficients used to produce the final index were: -0.282 (decile of votes cast for Wallace), 0.054 (structural index), with an intercept of 1.404.

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Limitations of the Data

The limitations of the data are discussed under four headings. The first has to do with an apparent counfounding between the variables in the modernity index and the dependent variables for specific hypotheses; the second focuses on the limitations of the index in further studies; the third has to do with the limitations of the sample, and the fourth with the reliability and validity of the variables.

Confounding of the Modernity Index with Several Dependent Variables

The final index of modernity, consisting as it does of educational and financial indices of the county residents, is confounded with Hypotheses 1 through 4 which deal with the educational and financial attributes of the teachers, who are also county residents. In this study this confounding is not considered to be problematic for the following reasons. First, the ratio of residents to teachers is on the average, approximately 1,000 to 1. Due to the size of this ratio, it is unlikely that teacher characteristics modify mean resident characteristics to an appreciable extent. Second, the resident to teacher ratio is smaller in the less modern (smaller, less dense counties) than in the more modern counties. Because of this ratio difference and because differences between teacher and resident characteristics are larger in the less modern counties, teacher attributes "increase" the modernity of the less modern counties more than they increase the modernity of the more modern counties. Given this result, the confounding between teacher and county resident characteristics, as it influences the various hypotheses, is probably of a conservative nature. Finally, the modernity index is a composite of other variables that are not confounded with either level of education or per capita income.

Generalization in Using the Modernity Index

It is convenient to distinguish between the generalizability of the results of the study and the generalizability of the use of the modernity index in other studies. The crucial word here is index. The Wallace vote is conceptually the primary variable in the index, for it is in this variable that the association between the index and the type of rationality is most apparent. The use of the Wallace vote in the index was completely circumstantial, dependent upon being in the right place at the right time.

The possibility of measurable association between any two variables is restricted by the range of variation in both. At other times or in other places, the proportion of votes cast for Wallace might not be so large, hence restricting its predictive validity. Other conditions also mediate the meaning attributable to the Wallace vote. The characteristics of the opposing candidates obviously alter the meaning implied by the relative portions of votes received, as do the individual and relative strengths of both the state and local Democratic and Republican political machines. Due to the possibility of moderated effects produced by any of these characteristics, the use of this particular index in other studies might not be advisable.

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Limitations of the Sample

The sample, consisting as it does of all the school districts within a single state, apparently provides for limited geographic generalization with regard to the results of the study. There are, however, several advantages in using data from a single state. Several hypotheses focus on the financial attributes of the districts. The level of state support to local districts varies widely across the fifty states. In analyzing data from several states, the variance in policies of the state departments of education concerning financial support are confounded with the district policies. Thus, even if samples of districts are available from several states, one cannot generalize unrestrictedly to schools or school districts in general. Further, Florida provides a higher than average level of state support to the local school districts. This higher level of support is likely to minimize that proportion of variance in district financial attributes due to local environmental differences. As such, the higher state support makes the research hypotheses of this study more difficult to support. In this sense, the tests of the financial hypotheses are conservative.

A similar contention may be extended to one of the pupil attribute hypotheses in which the dependent variable was college attendance rates. During the period in which the data were tabulated, Florida had (and yet has) one of the most elaborate systems of higher education in the fifty states, particularly with respect to the number and geographic availability of junior colleges. Thus, the college attendance rates for the respective districts are not as likely as national data to be confounded with the economic conditions of the local area or its geographic proximity to an institution of higher education.

Even though the above discussion describes several advantages of the present sample, its limitations cannot be ignored. In point of fact, however, the crucial limitation on generalization in this study is not so much in the sample as the results. One of the primary focuses of this study is to provide a framework within which the results of the school effect studies could be explained and replicated. To the extent that the results of this study are consistent with the findings of the school effects studies, the modernization or modernity framework has generalizability over and above that validated on the basis of the sample.

The Reliability and the Validity of the Variables

In general, the reliability of the measures used in this study should not be problematic. With few exceptions, the variable data points are means based on hundreds or thousands of individual observations, and because of this these points are likely to be quite stable. This latter point is particularly pertinent for the subtests of the ninth grade battery.[9] In the latter hypotheses of this study several of the subtests

[9]The subtests for the ninth grade battery are SCAT (verbal and quantitative), social studies, English, computational (traditional) and problem solving (modern) mathematics, and science.

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are used as controls against other subtests. The intercorrelations between these subtests range between .85 and .96. Due to these high intercorrelations there is only a moderate amount of uncontrolled variance available to the hypotheses under test. Because lack of reliability in either the control or dependent variables will increase the standard error formulas, even a moderate lack of reliability might seriously affect the results of the hypothesis testing.

Using the individual pupil as the unit of analysis, the internal consistency (KR-20) reliabilities of the subtests range from .86 to .91 (Technical Report No. 5-68). Because of the generally large number of pupils contributing to the various district means, it seems reasonable that the reliability of the district subtest means should be nearly perfect.

The question of validity is primarily relevant for the subtests of the ninth grade battery. No validity coefficients are available for the district means. Construct validity coefficients are available between the Stanford achievement and the ninth grade batteries, both of which have similar breakdowns in subtests. In a random sample of 900 Florida ninth graders (Technical Report No. 6-68) these validity coefficients ranged from .69 to .79. In order to extrapolate from the validity for individuals to those concerning district means it is necessary to consider how the pupils are distributed to schools, and the schools to districts. The correlations between the means will be the same as that for individuals (within the limits of sampling error) if and only if the pupils are distributed to schools, and the schools to districts on a random basis. If the "random assignment" does not hold, the correlations between means will differ appreciably from the correlations between the individual level attributes, depending upon how the pupils are distributed to schools and the schools to districts.

Further, if the process of pupil and school "assignment" were random the standard error of the district means would be equal to the individual raw score standard deviation divided by the square root of the number of pupils across which the district means were computed, nearly 100,000 in this case. For instance, the raw score standard deviation for SCAT (V) means is 2.46. Under the random allocation assumption the standard error of district means should be less than .01. It is thus obvious that pupils are not randomly distributed to districts.

Finally, only if pupils are more homogeneous (with respect to test performance) within districts will the subtest intercorrelations between district means be more positive than the correlations between the individual scores. Both the data from the previously cited school effect studies and the subtest intercorrelations in this study indicated such an occurrence. Comparison of the ninth-grade-battery subtest intercorrelations for individuals with those for the district means showed that the district means intercorrelated more positively than the individual scores. There is no reason ninth grade validities would not also be higher for the means than for the individual scores. On these bases it seems reasonable to assume that the ninth grade subtests are sufficiently valid for use in the testing of the hypotheses developed in the following chapter.

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CHAPTER THREE

SAMPLE, METHODOLOGY, HYPOTHESES AND RESULTS

The geo-political unit from which the sample was drawn is the state of Florida. The analytical units of the study are the 67 Florida counties and their coterminous school systems of school districts. A listing of the variables and their source is given in Table 4.

In general, the observations on the variables were taken between 1965 and 1968 inclusive. Where a temporal lag exists between observations on differing variables, the dependent variables, with one exception, post-date the observations on the independent variables. The lack of temporal contiguity should not be problematic in that it makes the tests of the hypotheses more conservative due to the intervention of other "effects" which presumedly would reduce the magnitude of the relationships (Campbell & Stanley, 1963).

The hypotheses of this study focused on the relationship between county modernity and three classes of school district attributes: characteristics of the district's teachers, selected financial attributes of the district, and mean district pupil attributes. The null form of all hypotheses, excepting Hypothesis 7, was tested by regression analysis. Because several hypotheses required a covariate, the method of analysis employed involved both simple and multiple regression. Regression was used because the data are quantitative rather than qualitative and under these conditions, the regression analysis design is, in general, more powerful than the analysis of variance design.

The degree of the equation is assumed to be one (linear). Under this assumption, the form of the regression equation in matrix notation is $\underline{Y} = \underline{X} \cdot \underline{B} + \underline{E}$. Additional assumptions are (1) the expected value of $E_i = 0$; (2) the variances of Y_i and E_i are constant for all values of X_i; (3) the assumption for t tests which states that E_i is distributed normally for all values of X; and (4) independent and random sampling. The validity of these assumptions is, of course, tenuous. Because of this, results from tests of hypotheses will require replication in time and/or space.

In all hypotheses excepting those that require a covariate, X_{1i} represented the modernity index, and the null hypothesis was $B_1 = 0$. Where a covariate was used, it was fixed as the first variable (X_{1i}). In the regression equation the modernity index was represented by X_{2i}. In these cases the null hypothesis was $B_2 = o$. In the interaction hypothesis (modernity by teacher experience), X_{3i} represented the value resulting from the multiplication of the modernity value (Xli), the null hypothesis stating that $B_3 = 0$.

All alternate hypotheses are directional.

Hypothesis 7 (see below) was tested by correlational rather than regression techniques. The test focused on the difference between two correlated correlations, the null hypothesis being that

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TABLE 4

A LISTING OF VARIABLES BY HYPOTHESIS AND SOURCE

Hypothesis Number	Independent Variable	Control Variable(s)	Dependent Variable(s)
1	Modernity[d]		Proportion of teachers with less than a Bachelor's degree[a]
2	Modernity		Proportion of teacher with Master's or higher degree[a]
3	Modernity		Average salary of teachers and principals[a]
4	Modernity	district enrollment[a]	No. of guidance counselors employed in district[b]
5	Modernity by Teacher Experience	modernity and teacher experience[a]	District mean on ninth grade SCAT (V+Q)[c]
6	a)Modernity		Percent by which local taxes exceed required local effort[a]
	b)Modernity	per pupil taxable county assets[a]	Percent by which local taxes exceed required local effort[a]
7	a)Modernity		Amount spent for administration versus that for instruction[a]
	b)Modernity		Percent spent for administration versus that for instruction[a]
	c)Modernity	district enrollment[a]	Amount spent for administration versus that for instruction[a]
	d)Modernity	district enrollment[a]	Percent spent for administration versus that for instruction.
8	Modernity		Percent children 14-17 years old enrolled in school[a]
9	Modernity		Percent high school graduates attending college[a]

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Table 1 (cont.)

Hypothesis Number	Independent Variable	Control Variable(s)	Dependent Variable(s)
10	Modernity		District mean on 9th grade SCAT (V+Q)[c]
11	Modernity	district mean on 9th grade traditional math test	District mean on 9th grade modern math test[c]
12	Modernity	district mean on 9th grade SCAT (V+Q)[c]	District mean on 9th grade science test[c]

[a]Research Report No. 54. Florida State Department of Education, Research Division; Tallahassee, Florida.

[b]Research Brief No. 35. Florida State Department of Education, Research Division; Tallahassee, Florida.

[c]Information compiled from Florida Ninth Grade Testing Program. Florida State University, Department of Educational Research; Tallahassee, Florida (unpublished).

[d]The variables used in the development of the modernity index are described in the previous chapter and, with the exception of the Wallace vote, are taken from source "a" above. The Wallace vote is taken from the pamphlet, Official Votes Cast in the 1968 General Election, distributed by Office of Secretary of State; Tallahassee, Florida.

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$P_1 - P_2 = 0$. In all cases the .05 or smaller alpha level was considered sufficient for the rejection of the null hypotheses.

The hypotheses were tested from the output of BMD02R at the Florida State University Computing Center.

The Development and Results of the Tests of Hypotheses

In the discussion of the open systems perspective it was stated that all social systems perform four basic functions: internal maintenance, external maintenance, adaptation and production. In the discussion of modernization it was indicated that as a social system becomes more modern, education and training become more important for the continuation and expansion of the social and technological order, that is, education and training become more important as both inputs and outputs of the production process. Thus it is reasonable to expect that, in the more modern counties, the primary emphasis of the school system is on producing students with those qualities necessary for successful participation in the modern society. Because of the social and technological complexity of the modern social system these qualities focus on the production and assimilation of knowledge and the tendency to make decisions on priorities established, in part, by this knowledge.

In contrast, in the less modern social systems, the maintenance functions are more important and the production functions less so. This primary emphasis on the maintenance of the traditional social order is by definition conservative. Because of the technological and social simplicity and the basically conservative nature of the less modern counties, it is reasonable to expect that education-training-knowledge, to the extent it is supportive of the modernization process, is considered by the county residents to be of relatively less value than in more modern counties. Correspondingly, it is reasonable to expect that the relative emphasis of the school system is not so much on producing students with those qualities necessary for successful participation in the modern society as on producing students who will maintain the standards and perspectives of the local, conservative social order.

It is around this general orientation that the hypotheses of this study were developed. These hypotheses fall into three nonexclusive groups: those relating to the characteristics of the professional personnel of the school; those relating to financial attributes of the school system and county; and those relating to the pupil characteristics.

Hypothesis and results for district personnel attributes.

Consider now the hypotheses relating to the characteristics of the professional personnel. In the school system the production function focuses primarily on instruction, and teachers are the line-operators in this function. To the extent that the quality of instruction becomes increasingly important as a function of increasing modernity, it is reasonable to expect that the teachers in the modern counties are more highly trained and receive higher salaries than those in the less modern counties. On this basis it was hypothesized that:

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1) The more modern counties employ fewer teachers without a bachelor's degree;
2) The more modern counties employ more teachers with a master's or higher degree;
3) The teachers in the more modern counties have the higher average salaries.[10]

The results for these hypotheses appear in Table 5.[11]

As is indicated in Table 5, each of the hypotheses concerning modernity and the personnel attributes of level of training and salary is confirmed. It is interesting to note that of the two levels of training attributes, the percentage with less than a bachelor's is the more predictable. This suggests that the more modern districts are more insistent on avoiding the employment of teachers with below average credentials than on hiring teachers with above average credentials.

Additionally, the reader might conjecture that the reason the average salary is higher in the more modern counties is the fact that they employ more highly trained teachers. Though there is likely some confounding between results of the two hypotheses, the accountable salary variance is roughly seven times larger than that for percentage with master's or higher degree. Under this condition it is impossible for the salary variation to be explained in terms of variations in the degree variable. The same explanation is also valid for variations in the below bachelor's variable.

Two other hypotheses concerning professional personnel characteristics were also tested. It has been indicated that modern social systems evidence greater functional specialization than those that are less modern. The use of guidance counselors, reading specialists, school psychologists, and other special service personnel is indicative of increasing specialization. Because of this, and because guidance counselors are closely allied with the social selection function of education, the following hypothesis was posited:

4) The more modern the county the greater the number of guidance counselors employed.

This hypothesis was tested with the population size of the school district statistically controlled, because the number of special service personnel depends partly on district enrollment. The results for Hypothesis 4 appear in Table 6.

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[10] Data on teacher salaries alone were unfortunately not available. This hypothesis will be tested by using the average salary of principals and teachers.

[11] Additional data on individual cases as well as the computations carried out here and elsewhere in the study can be obtained by writing to Center for the Study of Problems in Education, University of Missouri - Kansas City, 5100 Rockhill Road, Kansas City, Missouri 64110.

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TABLE 5

MODERNITY AGAINST TEACHERS' LEVELS OF TRAINING AND SALARIES

Hypothesis Number	Modernity Against	B_1[a]	RS[b]	df	t-value[c]
One	Percentage without bachelor's	-0.1923	0.277	65	-4.97***
Two	Percentage with master's	0.1819	0.086	65	2.85**
Three	Average salary	43.9460	p.544	65	8.76***

[a]The intercept for the regression equation, B_1, is not included in any table because its value is never used to test an hypothesis, and the concern in this study is with hypothesis testing and not in building an accurate prediction system. B_1 represents the slope function of the simple regression equation. In general, if a control variable is used it will be represented by B_1 B_2 representing the first-order partial regression coefficient. In all tables including more than one coefficient, the hypothesis under test will be represented by the last (right-hand most) coefficient in the table.

[b]RS represents the proportion of the dependent variable variance that is accounted for on the basis of the predictor variable. In all tables IRS represents the increase in the accountable variance due to the partial coefficient, if the latter appears in the table.

[c]In all tables, asterisks are used to denote the probability level exceeded in the hypothesis being tested. One asterisk represents the .05 level, two, the .01 level, and three the .001 level. The absence of an asterisk indicates the probability the results did not exceed the minimum alpha level (.05) required for rejections of the null hypothesis. In all tables the reported t-value represents the results for the last listed coefficient.

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TABLE 6

MODERNITY AGAINST THE NUMBER OF DISTRICT GUIDANCE COUNSELORS WITH DISTRICT ENROLLMENT STATISTICALLY CONTROLLED

Modernity	B_1 (enrollment)	RS	B_2 (modernity)	IRS[a]	df	t value[b]
No. of guidance counselors	.0013	0.937	-0.2867	.0023	64	-1.57

[a]The increase in RS due to variable 2.

[b]The t value refers to B_2 only.

The results in Table 6 indicate that the research hypothesis is not confirmed. The reason for this is obvious. The number of guidance counselors employed is an almost perfect linear function of the district enrollment. Only 6 percent of the dependent variable variance is independent of enrollment. This remaining 6 percent, it appears, is not significantly related to modernity. The negative weight of B_2, even though it is not significant, suggests a moderate tendency for the larger (more modern) districts to employ fewer special service personnel on a per-pupil basis. This is quite consistent with the national data on the public schools which indicate that the larger schools have the higher pupil/personnel ratios (Coleman, 1966).

It should be pointed out that one of the components of the modernity index is population density. In the state of Florida density and enrollment have approximately three-fourths of their variance in common. Without covariates, the modernity index is significantly and positively associated with the number of guidance counselors (as well as the number of school psychologists, and other special service personnel) employed. If the density component is partialed the modernity regression weight (B_2) falls within the limits of zero. This suggests that, to the extent the number of special-service personnel represents the level of functional specialization within the system, the level of specialization in the public schools is entirely redundant with, and possibly dependent upon, the per capita size of the system. Additionally, there is a possible explanation for this. The majority of special service personnel is supported from Federal and State monies. The extra-system monies are allocated on strict pupil/personnel ratios, such as one guidance counselor per 400 students. Because the districts provide little, if any, local support for these special service positions, they employ them on a relatively strict per pupil basis. This in turn would imply that the administrative units of the districts do not perceive a financially defensible need for these types of personnel over and above that filled by the extra-system appropriations.

The fifth and last hypothesis concerning personnel characteristics focuses on the contribution of teacher experience to pupil achievement.

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The school effect studies do not, in general, support the hypothesis that teacher experience is an important variable in the determination of student achievement. Bearing in mind the results of the Herriott & St. John (1965) and Doll (1969) studies, both of which indicate that the teachers' experiences and attitudes vary markedly from one type of school to another, it appears reasonable to expect that the cultural context of the school or school system has an affect on the length of experience. In modern school systems where the instruction function is paramount, experience may improve the quality of a teacher's teaching. In the more conservative, less modern school systems where instruction is less emphasized and the utility of knowledge less appreciated, the better teachers may leave the system in search of more rewarding experiences, or if they remain, they may adopt the prevailing attitudes, beliefs, values and the like.

This expected differential effectiveness of teacher experience as a function of the modernity of the local environment is an interaction hypothesis. Because the number of years of experience per se was not available, the proportion of teachers on continuing contract status was used as a proxy variable for the extent of teacher experience in the particular school district. In order to maintain the "sense" of the hypothesis it is stated relative to teacher experience. The interactive effect of experience and modernity upon achievement was posited as follows:

> 5) The association between the district SCAT (V+Q) means and teacher experience becomes more positive as the modernity of the local environment increases.

Before considering the results for the test of this hypothesis it should be noted that the SCAT is generally considered to be an aptitude rather than an achievement test. Its use as an achievement measure in this study is defensible on the grounds that pupils' scores on SCAT represent the levels of mastery they have achieved with respect to these and similar abstractions. Use of the SCAT as an "achievement" measure is consistent with that found in several school effect studies (i.e. Coleman, 1966; Shaycroft, 1967) where no distinction was made between aptitude and achievement instruments.

Hypothesis 5 was tested with the "main effects" of modernity and experience (proportion of teachers on continuing contract) statistically controlled (B_1, B_2 for experience and modernity respectively). The results appear in Table 7. The interaction was tested by the use of the cross-product term (modernity X percentage of teachers on continuing contract) after the effects of the individual "main effects" were partialed. The null hypothesis was that $B_3=0$, the alternative, $B_3<0$.

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TABLE 7

MODERNITY BY TEACHER EXPERIENCE INTERACTION UPON ACHIEVEMENT

B_1	B_2	B_3	IRS[a]	df	t value
0.514	0.875	-.010	.046	63	-2.45[b]

[a]This is the increase in RS due to B_3; RS for full model is .501.

[b]The t value is for B_3 only; the sign is opposite of that predicted, and would be significant under a 2-tailed test.

The data in Table 7 indicate that the hypothesis is not supported. Further, the negative sign of B_3 indicates that the data occur in a manner opposite to that predicted.

The raw score achievement means for four levels of modernity and four levels of experience are presented in Table 8. The grand means and variances of these two variables respectively are 50.18 and 10.7, and 52.6 and 11.8.

TABLE 8

SCAT (V+Q) MEANS BY EXPERIENCE AND MODERNITY

Modernity Levels	Percentage Teachers on Continuing Contract			
	30-44	45-54	55-64	65-74
65-74	(1)[a] 63.30	(2) 63.87	(3) 60.42	-----
55-64	-----	(10) 58.96	(8) 57.43	(1) 52.12
45-54	(4) 53.86	(7) 55.58	(7) 55.69	(1) 57.40
30-44	(3) 51.89	(8) 50.30	(4) 50.70	(8) 53.10

[a]The number in parentheses in each cell represents the number of observations in the respective cells.

The pattern of cell means suggests that teacher experience is moderately and negatively associated with achievement in the more modern counties and moderately and positively associated with achievement in the less modern counties. Though this pattern is not unequivocal, it does suggest

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a "generation'gap" type of effect. Assuming consistency between experience and age, it appears that in the more modern counties the younger teachers "produce" better achievement while in the less modern counties, the older, more experienced teachers produce better results. This ex post facto explanation is consistent with the argument on which Hypothesis 5 was based in the sense that it suggests that a simple linear test of the effects of experience on achievement is an over-simplification of a complex phenomenon.

The Financial Attribute Hypotheses and Results.

Since 1963, there have been a number of studies assessing the determinants of educational spending by local school districts. These studies, with two exceptions, have been reviewed by Hickrod and Salubo (1969). Of these studies only a few, by Miner and Alkin, [illegible] along with those of Burkhead (1964) and Johns and Kimbrough (1968), are of interest in the present study. The remaining studies focused on the prediction of total per pupil expenditures, and this variable is of no interest in the current study.

The studies of Miner, Burkhead and Johns and Kimbrough focused on the level of local financial support provided the local schools by their districts. The general conclusion of these studies is that the per pupil tax base is the most important predictor. In addition to this predictor, other variables such as the median family income, community opinion of the superintendent, the presence of two strong political machines (parties), and the number of high school graduates, contribute little in a systematic fashion to the determination of the level of local support.

The Alkin study (Hickrod & Salubo, 1969) is of interest because it used religious variables which presumably reflect value-belief-ideology variations. Using eighteen California school districts and total per pupil expenditure as the dependent variable, Alkin found the percent of district residents belonging to various religious groups i.e. Jewish, Catholic, to be significant predictors even after property valuations were controlled. Of the various religious groups, the percent Jewish was the best predictor. Though there is reason to question the reliability of this conclusion due to the small sample size and the possible confounding of state and federal with local appropriations, it does indicate that belief-value-ideology variations may influence per pupil expenditures.

Consider now the hypotheses relating to the financial attributes of the school system and the coterminous county. The great majority of monies available to the school system comes from one of three sources--the local, the state, or Federal governments. The relative proportion of the total monies contributed by each of these sources varies both within and across states. For the state of Florida during the middle and late 1960's Federal funds acounted for 10-15 percent of the state's noncapital-outlay and nondebt-service public schol funds. The local and state governments provided the remainder in approximately equal proportions (Garvue, 1969). The relative proportions of the total

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noncapital-outlay and nondebt-service funds from each of three major sources varied widely across the sixty-seven Florida counties during the 1966-67 school year due principally to the state's Minimum Foundation Program (MFP) and the presence of Federal facilities such as armed forces bases and National Aeronautics and Space Administration stations. The most typically-used measure--total expenditures per pupil--is derived by dividing the total of the school system's noncapital outlay and nondebt service funds by the average daily attendance in the system. Because of the variance in the Federal and state contributions this variable has questionable "meaning" as it relates to characteristics of the county and county residents, and for this reason hypotheses concerning total per pupil expenditures are not included in this study.

It is, however, reasonable to expect that the more modern counties, due at least partially to the increased value of knowledge and functional rationality in the culture, provide better financial support for their school systems than their less modern counterparts. This is to be expected in part because the more modern counties have higher levels of per capita wealth. However, the MFP requires each county to contribute to its school system in accordance with its ability as measured by the index of taxpaying ability. Because of this requirement, a more crucial test of the expectancy of better support as a function of modernity was posited in the following manner:

6) The more modern the county the greater is the percent by which collected taxes exceed the (legally) required local effort.

The results for Hypothesis 6 appear in Table 9.

TABLE 9

MODERNITY AGAINST THE PERCENT BY WHICH TAXES EXCEED THE REQUIRED LOCAL EFFORT

B_1	RS	df	$\underline{t}$ value
10.978	.425	65	7.04***

On the basis of the results in Table 9, one may conclude that modernity is positively related to level of local school support over and above that required by law. This is one of the most interesting hypotheses of this study for it is here that relationship between the functional rationality of the modern man and his willingness to support public education in financial terms is assessed. Because of the importance of this hypothesis, a survey of additional variables which might be related to the dependent variable was undertaken. The results of this survey indicated that the hypothesis, as presently tested, might be positively biased by economic factors.

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It was stated above that the present dependent variable was more appropriate than one simply representing the absolute amount of local financial support because of the legal support requirements placed on the counties by Florida's Minimum Foundation Program. This program requires that each county contribute to the state MFP fund in accordance with its ability to support public schools, ability being represented by the county's score on the index of taxpaying ability. On this basis it was assumed that scores on the index of taxpaying ability would be highly correlated with the per-pupil tax base as the latter is, by definition, the most valid indicator of the counties ad valorem wealth. Additional analysis indicated that the association between these two economic indicators was considerably lower (.65) than had been expected. Further, it also indicated that the correlation between the dependent variable and the per-pupil tax base was sizable (.73). This suggests that the high t value reported in Table 9 might be markedly dependent upon the fact that the more modern counties also tend to have considerably greater economic wealth. This does not, of course, invalidate the conclusion that the more modern counties provide greater school support than required, but it does suggest that this additional support might be based purely upon greater wealth. For this reason Hypothesis 6 was re-tested (B_2) with "nonexempted assessed evaluation per pupil" partialed (B_1). The results appear in Table 10.

TABLE 10

RESULTS FOR HYPOTHESIS SIX WITH PER-PUPIL TAXBASE PARTIALED[a]

B_1	B_2	IRS[b]	df	t value
.5687	3.736	.0753	64	3.54***

[a]The RS for the full model is .61, and the corresponding t is 7.2.

[b]Increase in RS due to B_2.

On the basis of the information in Table 10 it would appear that the more modern counties, relative to less modern counties, provide higher levels of financial support for their schools even after legal and economic ability controls are made. It should be noted that there is a substantial drop in the proportion of variance associated exclusively with modernity after the tax-base or ability variable is partialed. This reduction is entirely consistent with the discussion of modernization advanced earlier in which it was stated that the more modern geopolitical areas are also the most economically advanced. Further the correlation (.58) between the modernity index and the per-pupil tax base suggests that in those studies where a per-capita index of wealth is not available, a per-pupil tax base variable might be a valid component of a modernity index.

The first three and the sixth hypotheses have been developed partially from the contention that the more modern the county the more emphasis

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is placed on the production or instructional function of the school system. Further, it has earlier been stated that the less modern the county the more the school system functions conservatively to maintain the local culture. One of the primary functions of the administrative section of the school system is to maintain relations with its environment (external maintenance) or in this case, the county. In short, as the counties become more modern, more emphasis should be given to the instructional (production) function and less to the external maintenance aspect of the administrative function. Because the amount of money available to the school system for any school year is more or less fixed, it is reasonable to assume that the priorities of administration and instruction are reflected in the amount of the total expenditures per pupil allocated to each of these two functions. The following hypothesis tests for the difference in these priorities:

7) The amount of per pupil expenditures allocated for instruction is more positively associated with county modernity than the amount of these expenditures allocated for administration.

It should be noted that this hypothesis is potentially conservative. To the extent that the variable total expenditures per pupil is positively related to modernity, it is likely, other things being equal, that the amount of money spent for administration would increase as does modernity. Additionally, in order to detect the possible confounding of a change in the administrator to teacher ratio as one moves from the smaller to the larger, more densely populated counties, the hypothesis was tested both with and without school system size statistically controlled. The reader should note that the associations between modernity and the two amounts are stated in relative, not absolute, terms.

TABLE 11

THE DIFFERENCE BETWEEN CORRELATIONS OF MODERNITY WITH ADMINISTRATIVE AND MODERNITY WITH INSTRUCTIONAL EXPENDITURES

		Modernity with: Admin.	Inst.	df	t
Without Parting	Raw Data	-.48	.19	64	4.86***
	Percentage Data	-.53	.66	64	2.34*
Size Parted	Raw Data	-.29	.03	61[a]	2.29*
	Percentage Data	-.31	.38	61[a]	1.68*

[a]It is assumed that one additional degree of freedom is lost in computing each of the three part coefficients.

The information presented in Table 11 indicates that as modernity increases, the amount and percentage of total per-pupil expenditures spent for instruction, relative to that spent for administration, also increase. To the extent that the monies allocated for the instructional and administrative school functions are associated with the relative priorities of these functions one may conclude that as modernity increases, the importance of the instructional function relative to that of the administrative

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function also increases.

Concerning the coefficients in Table 11, it should be noted that the administrative and instructional percentages are not ipsative in that there are additional expenditure categories for plant operation, maintenance and special services. In actual fact, however, the two percentages are markedly negative in their association (r=-.82) while the two raw amounts are positively associated (r=.51). A comparison of the t values indicates that both of the controls reduce the effect associated with modernity. The district-size control is probably overly severe due to the fact that population density was a variable used in the derivation of the modernity index. Because size and density are highly related variables (r=.65), the final t value represents the association between modernity and expenditure patterns which is independent, not only of school wealth, but also of that proportion of modernity-expenditure variance that is associated with population density. Given this, the final t value may be considered a conservative test of Hypothesis 7.[12]

Hypotheses and Results Relating to Pupil Attributes.

Consider now the hypotheses related to the pupil characteristics. As the reader has doubtless expected, the gist of the expectancies concerning modernity and pupil characteristics is that the pupils in the more modern counties compare favorably with those in the less modern counties in terms of standardized test achievement, college attendance, and school drop-out rates. In no uncertain terms these expectancies are cast in the context of technological and cultural determinism. The influence of technology upon the pupil attributes, it is assumed, operates indirectly via its influence upon the country cultural characteristics. The cultural characteristics, it is assumed, influence the pupil attributes both directly and indirectly, directly through the socialization process, and indirectly through the influence of the cultural characteristics upon the educational process as it is conducted in the local school system. Because of this assumption that the environmental and school system influences are conjoint, and because no direct measure of the quality of the educational process as it is conducted in the local school system is available, a statistical separation of environmental influences from school system influences as they affect the

[12] It is interesting to compare the last two pairs of correlations (Table 11) with respect to alternative explanations as to how the differences might occur. If the correlations between modernity and the raw amounts were of the order $/r_{MA}<0,\ r_{MI}=0/$ when district enrollment or size, was controlled, one might conclude that the increased instructional expenditures were absorbed primarily by the tendency of the larger districts to have more elaborate instructional facilities. The third pair of correlations in Table 11 tends to support this explanation.

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pupil attribute measures was not attempted. Thus, the hypotheses are stated relative to the direct and indirect influence of modernity upon the pupil attributes.

Consider first the two hypotheses (below) concerning student enrollment. As has been earlier indicated, the more modern the environment, the more crucial becomes the acquisition of knowledge and learning skills. Formal educational institutions are contrived to fill this need. Further, it is reasonable to expect that the mere presence of these institutions is not in itself sufficient to guarantee their use, but rather that their services must be viewed as being functional by the students and/or their parents. This perceived functional nature of the process of education is one operational manifestation of what has been termed functional rationality. On the basis of these considerations it was hypothesized that,

8) the more modern the county, the higher is the percent of high school graduates attending colleges and universities, and that

9) the more modern the county the greater is the percent of individuals aged 14-17 who continue their enrollment in the district's public schools.

The results for Hypotheses 8 and 9 appear in Table 12.

TABLE 12

MODERNITY AGAINST COLLEGE ATTENDANCE AND SECONDARY ENROLLMENT RATES

Hypothesis Number	Dependent Variable	B_1	RS	df	$\underline{t}$ value
8	% Col. Attendance	.6138	.310	65	5.41***
9	% Sec. Enrollment	-.0427	.007	65	-0.74

On the basis of information presented in Table 12 it is apparent that Hypothesis 8 is confirmed and that Hypothesis 9 is not. The first of these results is consistent with the finding of the school effect studies. In general, these results indicate that college attendance rates are substantially and significantly predictable given information reflecting the social context in which the schools function.

The lack of significance with respect to secondary enrollment has at least two possible explanations. First is the possibility of error in the dependent variable itself. Officials in the Florida State Department of Education Research Division were questioned concerning the reliability of certain school related measures used in the study. They indicated that the recording procedures were consistent from district to district,

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with the exception of the secondary school enrollment data. With regard to the latter, they indicated that the criterion for recorded student enrollment differed appreciably across districts, primarily due to the relationship between state aid and the district's size of enrollment. There may be, then, considerable variation in what the enrollment data actually represent. Second, the result for Hypothesis 9 is, in a sense, consistent with the findings of the school effect studies. In general, these studies have evidenced no consistent pattern of association between predictor variable and drop-out rates. Further, in nearly all cases, the drop-out rates have been the least predictable of the pupil attribute variables. Whether or not these latter results are dependent upon variations in the local criteria for determining enrollment remains an open question.

In the two previous hypotheses the effects of functional rationality were operationally defined in terms of continued enrollment in educational institutions. In the development of the last three hypotheses functional rationality is conceptually defined in terms of achievement orientation and operationally defined both generally and specifically in terms of standardized test achievement.

At the district level, an achievement orientation may be said to consist of two components. One component is derived from the pooling across pupils of an individual attribute equivalent to the achievement motive as defined by McClelland (1953). The second component is more appropriately perceived as a school or school district resource component. It is probably best represented by the extent and elaboration of instructional facilities, such as BSCS biology programs, labs and shops, teacher competence and other factors assumedly reflecting the type of orientation instilled in the students. The crucial points are that the quantity and quality of academic district resources result from decisions made by the district personnel, and that these resources reflect both the kind and quality of achievement emphasized by the district.[13]

Hypothesis 10 is the general effect hypothesis. The dependent variable in this hypothesis should represent the effects of a general achievement orientation. For this reason, the district means on the combined verbal and quantitative subtests of the School and College Ability Test were selected as the dependent variable. As is the case for this and the remaining hypotheses, the district achievement means were compiled from the results of the Florida Ninth Grade Testing program. The hypothesis is stated as follows:

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[13]The collection of the two components into a single construct is, admittedly, undesirable in that it would be preferable to assess their effects individually. The data available in this study do not, unfortunately, permit such a separation. It is for this reason, and to emphasize that school district resources also moderate the results of the hypotheses, that the term "achievement orientation" was introduced.

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10) The more modern the county, the higher is the mean district achievement as measured by the SCAT (V+Q).

The results for this hypothesis appear in Table 13.

TABLE 13

MODERNITY AGAINST SCAT ACHIEVEMENT

B_1	RS	df	t value
.3017	.435	65	7.10***

As is indicated by the results in Table 13, the hypothesis is accepted. There is a significant and positive relationship between the modernity of the county and the extent to which a general achievement orientation as reflected by SCAT (V+Q) is engendered in the school district's students. The results are quite consistent with those of the school effect studies in terms of the proportion of accountable achievement variance. In general, the proportion of achievement variance attributable to a best linear combination of environmental characteristics ranges between thirty and fifty percent. Also consistent with the results of the school effect studies is the fact that achievement is more predictable than college attendance rates (44% versus 31% accountable variance). These two findings concerning the prediction of achievement and college attendance rates are the most crucial of this study in replicating the major findings of the school effect studies.

The next two hypotheses are extensions of the modernity framework beyond the results of the school effect studies. The focus is on the selective emphasis attributed to mathematics and science achievement as a function of the modernity of the district's environment. Throughout the discussion of modernity, continued emphasis was given to the importance of technological development as one requisite for progressive or continued modernization. In the public schools, the essentials for mastery of technological information, as traditionally defined, are established in the mathematics and science courses. Thus, as counties modernize, the mastery of technologically related subject matter, i.e., science and mathematics, becomes progressively more important. Hence, it is reasonable to expect that achievement in these areas receives differential emphasis, that is, that the achievement orientation is selectively emphasized in these areas over and above that emphasis given to less technologically-oriented subject-matter areas.

Consider first mathematics achievement. There are currently available to the public schools, two types of general mathematics curricula, traditional and modern, or new, mathematics. The latter is based on a set theory approach and is said to provide a better foundation for advanced mathematics and science.

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In the ninth grade battery there are two mathematics subtests (Technical Report No. 4-68), which correspond reasonably well to the above distinction between traditional and modern mathematics. The traditional mathematics test emphasizes primarily recall and recognition of mathematical facts, for example 15x325 = ____, or a triangle consists of ____ degrees. The second subtest emphasizes concepts and problem solving. The "new mathematics" is essential for roughly only one-third of these items, but emphasizing as it does the properties of number systems, sets, statistics and probability, and so forth, it can be considered "modern mathematics" insofar as the intent of this study is concerned.

Assuming the validity of the above distinction, it appears reasonable to expect that the modernity of the district is associated with the emphasis given to the modern mathematics approach over and above that given to the traditional approach. To the extent that the achievement orientation is differentially focused as a function of modernity, county modernity should predict modern mathematics achievement over and above that predictable on the basis of the traditional mathematics achievement. In this case traditional mathematics achievement may be considered to represent a general mathematics achievement orientation. The proportion of modern mathematics variance which is not accountable on the basis of the general achievement orientation, but which is associated with modernity may be said to represent the selectivity of the achievement orientation. It is, of course, expected that this association will be positive. On the basis of these considerations the following hypothesis was developed.

11) The more modern the county, the higher is the mean district achievement on a modern mathematics test, after district means on a traditional mathematics test have been partialed.

A similar hypothesis was developed with respect to science achievement. The control, or partialed, variable in this case was the SCAT (V+Q). Not only is SCAT the variable defined to represent the effects of the broadly defined achievement orientation of the ninth grade battery subtests, it is also the instrument which should, in terms of skill requirements, be the best predictor of science achievement. As was the case with the preceding hypothesis, the science hypothesis is stated so as to reflect the increased emphasis given to a technology-related content area over and above that given to a more general achievement orientation. The hypothesis is stated as follows:

12) The more modern the county, the higher is the mean district achievement on a general science test, after district means on the SCAT have been partialed.

The results for Hypotheses 11 and 12 appear in Table 14. In each case the control variable was entered into the regression equation first. The test hypothesis was that $B_2=0$, the alternate, that $B_2>0$

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TABLE 14

MODERNITY AGAINST MODERN MATHEMATICS AND SCIENCE WITH TRADITIONAL MATHEMATICS AND SCAT (V+Q) CONTROLLED

Hypothesis Number	Partialed Variable	Dependent Variable	B_1	B_2	RS[a]	IRS[b]	df	t va
11	Trad. Math	Mod. Math	.835	.036	.742	.030	64	2.9
12	SCAT (V+Q)	Science	.511	.024	.912	.005	64	1.9

[a] RS due to partialed variable.

[b] Increase in RS due to predictor variable.

[c] All t values refer to B_2.

On the basis of the information presented in Table 14, the hypotheses are accepted and one may conclude that the modernity of the environment produces an emphasis on achievement in technology-related academic areas. The results also indicate that the increase in accountable variance is small. This is to be expected, in part, because of the high intercorrelation between all sub-test means in the ninth grade battery. These intercorrelations range around .90.

There is, however, a limitation to the results presented in Table 14. On the basis of these results one cannot distinguish between the confirmation of the hypotheses and the possibility that the modernity index is associated with that portion of test variance which is independent of the variance in the remaining tests. In order to assess the likelihood of this latter possibility, two additional, non-technology-oriented subtests, English and social studies, were selected from the ninth grade battery. Because both content areas are predominantly verbal, the verbal subtest of the SCAT was used as the partialed variable; the modernity index was entered as the second variable in the regression equation. These two hypotheses were tested using standardized regression coefficients. (Nonstandardized coefficients representing the units of analysis were used in the previous regression tables.) Standardized coefficients were used because this check on the mathematics and science hypotheses did not occur to the writer until the previous data had been analyzed on the computer. The standardized coefficients were computed by hand from accessory information furnished on the original printout. The statistical results would be the same had the nonstandardized coefficients been used (Li, 1964).

The results for the English and social studies hypotheses appear in Table 15.

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TABLE 15

MODERNITY AGAINST ENGLISH AND SOCIAL STUDIES ACHIEVEMENT WITH SCAT (V) PARTIALED

Dependent Variable	B_1	B_2	df	t value[a]
English	.90	-.14	64	-0.99
Social Studies	.91	-.12	64	-1.01

[a] t values are for B_2 only.

The first-order partials in Table 15 are not significantly different from zero. These results in conjunction with those from Hypotheses 11 and 12 would appear to indicate that, in the more modern districts, technology-related content areas receive greater emphasis than that given to nontechnology-related content areas.

The data thus far presented have indicated substantial relationships between the modernity of the school districts' environment and the personnel, financial and pupil attributes of the districts. With respect to the personnel attributes of salary and highest degree earned and with respect to the pupil attributes of college attendance rates and general achievement, the results of this study are consistent with those of the school effect studies.[14]

In order to be further consistent with the results of the school effect studies (consistent with the results, not the conclusions) additional information must be presented indicating that these above mentioned district attributes do not contribute markedly to the output characteristics after the environmental characteristics are partialed. Such information is presented in Table 16. County modernity is the partialed attribute. The output attribute is SCAT (V+Q) county means.

The results in Table 16 are consistent with the results of the school effect studies. That is, these selected district attributes do not contribute markedly to pupil achievement over and above that influence attributable to extra-school influence. It should be noted, however, that, in the zero-order coefficients, there is evidenced moderate relationships between several district attributes and pupil achievement means. In the conclusions of the school effect studies the implication is that these zero-order relationships are spurious by virtue of the fact that they are "due" to the association between the extra-district

[14] Information relating to the other hypotheses of this study was not presented in the school effect studies.

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TABLE 16

ZERO AND FIRST-ORDER PARTIALS BETWEEN TEN DISTRICT ATTRIBUTES AND SCAT (V+Q) MEANS

District Attribute	Zero-order Coefficients	First-order Partial Coefficients
1. Total Enrollment	.356	-.082
2. % Teachers with Masters, or Higher Degrees	.020	-.240
3. % Teachers without Bachelor's	-.383	-.056
4. % Teachers on Continuing Contract	.098	.186
5. Total Per Pupil Expenditures	.014	.072
6. TPPE for Administration	-.312	.003
7. TPPE for Instruction	.219	.127
8. Average Salary	.524	.097
9. No. of Guidance Counselors	.268	-.040
10. No. of School Psychologists	.289	-.001

influences and pupil attributes. In the present study the implication is that the relationships result from the joint effect of extra-district and district influences, and that the apparent spuriousness results from the fact that extra-district attributes, particularly the modernity of the socio-cultural context within which the schools function, influence the manner in which the process of education is conducted by the schools.

Summary

In this chapter the hypotheses of the study were developed and the results presented. The general hypothesis of the study was that the modernity of the socio-cultural context within which the public schools function influences the manner in which they conduct the process of education.

In order to assess the validity of the general hypothesis twelve specific hypotheses were developed. These specific hypotheses focused on relationships between the level of modernity predominating in the social system and selected school-district attributes. The school district attributes were grouped into three classes: the characteristics of its personnel, its financial attributes and the attributes resulting from the type of orientations instilled in its pupils.

Results for nine of the specific hypotheses supported the general hypothesis; three did not.

Concerning the personnel attribute hypotheses, it was demonstrated that there is a substantial association between the modernity of the county and the characteristics of the school district's personnel both in regard to their level of training and their salaries. Two of the

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personnel-oriented hypotheses, however, were not confirmed. Of these, the number-of-special-service personnel hypothesis was not supported because the number of such persons employed by the district is an almost perfect linear function of district enrollment, which was used as a control variable. The remaining personnel hypothesis was the only one in which the results were clearly antagonistic to the lines of reasoning developed in the earlier chapters of the study. It was hypothesized that the relationship between experience and achievement would increase as did county modernity. Though the results did not support this hypothesis they did suggest both that teacher experience is a more "potent" variable than is indicated by the results of the school effect studies, and that its effects are too complex to be well represented by a simple linear function.[15] Further, the results may indicate that the most important consideration in teacher experience is whether or not it is indicative of (or produces) a social perspective in the teachers which is similar to, or consistent with, that held by the pupils. The inference is that only when these perspectives are consistent is experience positively associated with student achievement.

The results of the two financial attribute hypotheses are also supportive of the general hypothesis. More specifically, they indicate that the modernity of the county influences the economic priorities placed on education in general and instruction in particular, by both the county residents and the district administration. To the extent that there are differences in the economic priorities, it is reasonable to suppose that there is also considerable difference in the non-economic priorities such as the allocation of instructional time, the status of teachers, professional esprit de corps, and other parameters of a psychological and socio-psychological nature.

Of the pupil attribute hypotheses only one, the percent of secondary school enrollment hypothesis, was not supportive of the general hypothesis. Questions concerning the validity of this dependent variable were presented earlier, and warrant no further consideration. In the remaining pupil attribute hypotheses, the results indicate that there is a substantial and positive relationship between the level of modernity predominating in the social system and the extent to which an achievement orientation has both general and specific effects, the specific effects resulting from an emphasis in the academic content areas most closely related to technology.

Following the presentation of the twelve formal hypotheses of the study and their results, standardized zero- and first-order partial coefficients

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[15] In order to further assess this "potency," a polynomial model consisting of the modernity, experience, the experience term squared, the cross-product term and the cross-product term squared, was regressed against the SCAT achievement means. This polynomial increased the accountable variance by 12% over that produced by a simple linear composite of the modernity and experience terms alone.

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representing the relationships between selected district attributes and the district achievement means were presented. (The modernity index was the partialed variable.) The zero-order partials indicated moderate relationships between the selected district attributes and the achievement means. However, when the modernity index was partialed, the first-order coefficients were, in general, of a reduced magnitude. Both the zero- and first-order partials were generally consistent with the results of the school effect studies. In the school effect studies the implication is that the zero-order coefficients are spurious; in the present study the implication is that they represent the influence of the modernity of the socio-cultural context as it is manifest through the operations of the public schools.

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CHAPTER FOUR

CONCLUSIONS AND IMPLICATIONS

This chapter discusses the conclusions and implications of the study. Suggestions for further research are also provided. However, before turning to these particular, consideration should be given to generalizations which cannot be made on the basis of the results. In this regard, three points warrant mention.

First, one cannot conclude that the less modern social systems, including, in this case, both the districts and their environments, are less supportive of the educational process than are their more modern counterparts. Such a conclusion presumes the existence of a consensually validated set of goals for all educational systems. To the extent that the purpose of public education in the less modern social systems is to instill in its students the perspectives, values, beliefs and attitudes consistent with those of the local social order, one may conclude that this purpose is being reasonably well fulfilled. To the extent that the purpose of the educational system is to instill in its pupils those perspectives, beliefs, values and attitudes consistent with the requirements of the more modern areas, one may conclude that this purpose is better achieved in the more modern than in the less modern social systems.

Thus, in evaluating the effectiveness of the schools, it is necessary to distinguish between their national-institutional and their local roles. Since the United States is a modern nation, the national-institutional role is correspondingly modern. Within the national boundaries there is considerable variation in the local role (purpose) of the schools, and, as indicated by this and the Herriott and Hodgkins (1969) studies, the products of the schools differ accordingly. To evaluate the productivity of the public schools by a single common criterion (the national-institutional role) is to ignore these sub-system or local variations and to hence presume that the schools are basically similar and unaffected by the requirements made upon them by their local environments.

Second, one cannot generalize beyond the levels of modernity existing in the present sample. This restriction results not only from the assumptions of regression theory (Li, 1964) but also from open systems and sociological theory. To the extent that one evaluates positively higher achievement and higher college attendance rates, the results of this study present a relatively "rosy" picture concerning the effects of increasing modernization. Both social theory and the open systems model, however, would emphasize the fact that as structural differentiation and functional specialization increase, there also occurs increasing stress on the mechanisms through which social integration occurs. Thus the interaction noted by Herriott and Hodgkins (1969), between social class and the central-city, non-central-city location of the school upon achievement and college attendance rates (central city rates for the working class are lower) is but one example of the negative effects that can occur if increased social differentiation is not also matched with increased effort.

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(and results) on problems of social integration. The essential point is that increasing levels of modernization, especially if indexed by demographic, industrial or economic data rather than by cultural indices, cannot be "assumed positive" without reference to other parameters, such as social integration.

Third, one cannot generalize unrestrictedly beyond the method of analysis or the variables included in the analysis. The teacher experience by modernity interaction at least suggests that other district attributes may have both nonlinear and substantial effects upon the pupil attributes. Further, it should be noted that in both the present study and the school effect studies several classes of variables are absent from the analysis. Of particular importance here are variables reflecting the administrative attributes and the types of school organizational schemes employed, both in terms of grade organization (1-6, 7-9, 1-12) and in terms of self-contained versus departmentalized academic groupings. Doll (1969) reports that each of these variables is important, though in a nonlinear fashion, in determining the type of academic orientation instilled in the schools' pupils. Results such as these suggest that important school attributes have not been included in the recently conducted studies, and that the effects of the variables included are much more complex than had originally been assumed.

Within the context of these restrictions on generalization, the following conclusions and implications may be inferred from the theory and results of this study:

1) The general hypothesis of this study was that the structure and functioning of the schools are influenced by modernity of the sociocultural context of the area served by the schools. This general hypothesis was developed from two basic premises. The first stated that the public schools are basically contrived, open, social organizations, and as such the relationships between the schools and their environments are characterized by mutual dependence. The second stated that the modernity of the sociocultural context of the area served by the schools is a major determinant of the qualitative and quantitative variations in both the local environment's support of the schools and in goals of the socialization (education) process adopted by the schools. Within the limitations previously noted, the results of the specific hypotheses support the general hypothesis, and hence, inferentially provide support for the two premises.

Concerning the four common system functions, internal maintenance, external maintenance, adaptation and production, the results support the notion that modernity affects the operation of these functions. The external maintenance function focuses on the procurement of organizational inputs; the results indicate that the quality of organizational inputs, both in terms of personnel and financial support, increases as does the modernity of the sociocultural context. The internal maintenance function focuses on the distribution of resources within the organization. The results indicate that as the context of the schools becomes more modern the instructional function becomes relatively more emphasized and the administrative function relatively less important, when importance is measured in monetary terms.

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The relative consonance between the modernity of the county and the characteristics of the district's pupils provides evidence of the school's adaptability to varying environmental constraints, and the differential achievement in technology-related and nontechnology-related academic areas suggests that the adaptation extends also to content emphases in the production (instructional) process.

2) The theory and results of the study indicate that many of the major conclusions of the school effect studies may be interpreted within the context of the requirements and products of the modernization process. In this same regard they also suggest that in ignoring the fundamentally open nature of the public schools these studies may have predisposed conclusions, e.g. marginal or nonexistent effectiveness, which, though technically correct, are misleading insofar as the local effectiveness of the schools is concerned.

3) To the extent that equality of educational opportunity is defined in terms of an equal probability for successful participation in a modern society, the results of the study indicate that school districts vary in the degree to which they provide this equal opportunity, and that one of the primary constraints on this provision is the modernity of the beliefs, values and ideologies predominating in the immediate environment of these districts.

4) The theory and results of the study support the notion of local influence on the educational process. It is quite likely that part of this influence is facilitated by the dictum of local (legal and financial) control. To the extent that the productivity of the public schools assumes increasing priority at the state and federal levels, it is also likely that this priority will need to be matched at these same governmental levels with increased legal and financial responsibility for the conduct of the educational process.

5) To the extent that educational institutions in varying social contexts do differ in the manner in which they conduct the educational process, the theory and results imply the need for a differential preparation of teachers on the part of the teacher training institutions. If the term "disadvantaged" may be changed to "less modern" without violating its meaning, then the suggestion would be that teachers for the modern districts might be trained primarily as academic content consultants while those in the less modern districts or schools, especially at the elementary levels, might receive more training in motivational and behavior modification techniques. The work of Brookover (1962) with the parents of underachieving pupils is a possible model here.

An additional suggestion would be the introduction of computer assisted instruction in the less modern schools. Such an introduction would be an introduction to technology and might facilitate the pupils' sense of environmental control, a characteristic apparently in short supply in less modern and disadvantaged pupils (Coleman et al., 1966; Hagan, 1962; Lerner, 1958; Wilson, 1959).

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Suggestions for Further Research

There are three suggestions for further research that stem from the theory and results of this study. They are as follows:

(1) From the perspective of school effect studies, the types of school or school district attributes investigated should be expanded. More specifically, attributes representing the quality of administrative leadership, and the organizational patterns of the schools, classes and curricula should be investigated. Additionally, as has been repeatedly implied, the possibility of nonlinear relationships between environmental and district, environmental and pupil, and district and pupil attributes warrants careful consideration before conclusions concerning the independent effectiveness of the public schools are posited.

(2) Since a major limitation of the study concerns the absence of variables which may be said to intervene between the various system level attributes, these variables need to be defined, isolated and their effects researched. For example, it has been demonstrated that there is a significant and positive relationship between county modernity and the level of local financial support provided the schools. Whether this higher level of local support is due to decisions made by either or both the county board or by the general public (in district-wide referenda) remains to be determined. In much the same manner, what are the factors mediating the associations between modernity and administrative and instructional expenditures? Are the differences in the sign and magnitude of the associations dependent upon a tendency for the more modern counties to have more elaborate instructional facilities, or are the differences due to other factors? Through what mechanisms is the achievement orientation instilled in the pupils, and if there is a difference between the expectations developed in the home and those prevailing in the school, what factors determine the relative importance of influence of the two? Is there a level at which the differences in these expectations become detrimental to pupil performance?

(3) The final suggestion for further research is more of a sociological than an educational nature. The modernization model developed in this study is a social change model. This study has at least partially demonstrated that the model is productive (in the research sense) and valid for cross-sectional research. However, a longitudinal analysis would provide a more crucial test of its validity and productivity in helping to understand and predict the patterns of social change. Further, it remains to be seen whether or not the model provides equally well for the understanding the influence of environmental attributes on the characteristics of social institutions other than the schools.

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